

# The Iron Age

## A Review of the Hardware, Iron and Metal Trades.

Published every Thursday Morning by DAVID WILLIAMS, No. 83 Reade Street, New York.

Vol. XX: No. 2.

New York, Thursday, July 12, 1877.

\$4.50 a Year, Including Postage.  
Single Copies, Ten Cents.

### Portable Engine by the Ames Iron Works.

Our illustration represents a portable engine suited to the wants of farmers, lumbermen, miners, cotton planters, contractors, and, in fact, anyone who desires a first-class engine mounted as a portable. A large number of them are annually sent to South America, and the demand for them is constantly increasing. These engines are provided with every requisite in the way of pumps, gauges, safety valves, governors, gauge cocks, gauge glasses and spark arrester. In addition to the pump driven by the engine there is a hand pump by which the boiler may be filled when cold. The crank shaft has two band wheels, one on each side, which also take the place of fly wheels. The boiler is of the well known type used by the Ames Iron Works, which we have previously had occasion to describe. These engines are constructed on very strong trucks or running gear, having wood or iron wheels, as may be preferred. The bolster being placed under the end remote from the furnace, so that the bulk of the weight is placed upon the hind wheels of the truck, the axles of which are made from the very best refined hammered iron, while the hind axle is curved to the exact shape of the boiler at the fire box end, which gives an equal bearing to the parts attached, this not only gives extra strength, but prevents any local strain on the bearings or axle boxes. The boxes are manufactured from new designs. Brackets or "clips" are also bolted to the boiler, which are constructed to abut the shoulders of the axles, thus firmly bracing them against the effect of sudden trial or shock. A salter spring balance is used on the safety valve instead of a weight. The smoke pipe is hinged, and provided with a spark arrester. The engine is also provided with a flexible suction pipe with rose strainer, an extra force pump for supplying the boiler while at rest, and a comfortable seat for the driver. Eleven different sizes of these engines are made, varying from 5 to 40 horse-power. The manufacturers are the Ames Iron Works, Oswego, N. Y. The office in New York city is at 38 Cortlandt street.

### The Siemens Patent in the United States.

We take the following from the *Official Gazette* of the United States Patent Office: C. W. SIEMENS.—*Interlocutory Appeal. [In the matter of the application of Charles W. Siemens for Letters Patent for "IMPROVEMENT IN THE MANUFACTURE OF IRON AND STEEL," filed August 11, 1876.—Decided June 7, 1877.]*

The domestic application for an invention already patented abroad need not be restricted to precisely the same subject matter as the foreign grant.

It must, however, be divided if found to conflict with the rule respecting duplex applications.

If the domestic application is for the same subject matter as the foreign patent, with immaterial variations, the requirement that the patent granted shall be "limited to expire at the same time with the foreign patent" will be strictly followed, and the limitation be made directly upon the face of the instrument.

Where new features are introduced, and are in combination with those contained in the foreign patent, such limitation cannot be made; but in event separate claim is laid to matter set forth in the foreign patent, specific mention by date and number of such patent must be entered in the domestic specification.

A domestic application made up from a number of foreign patents will be divided for the purpose of restricting the term if the subjects matter separated are not properly in combination.

Section 4887, Revised Statutes, construed as an exception to Section 4884, with respect to the term of patent grants, and the language of the section, "so limited as to expire," held to require that the limitation shall appear upon the face of the patent.

[C. S. Whitman, for applicant.]

DODDLITTE, Acting Commissioner:

The question herein involved is substantially as follows:

Does our statute contemplate that a foreign patentee should, in making an application for a patent here embracing the same invention, restrict his American application to precisely the same subject matter covered by his foreign patent, subject, of course, to our rule requiring a division of the application should the foreign patent be duplex?

Section 4887 provides—

"No person shall be debarred from receiving a patent for his invention or discovery, nor shall any patent be declared invalid by reason of its having been first patented or caused to be patented in a foreign country, unless the same has been introduced into public use for more than two years prior to the application. But every patent granted for an invention which has been previously patented in a foreign country shall be so limited as to expire at the same time with the foreign patent, or, if there be more than one, at the same time with the one having the shortest term, and in no case shall it be in force more than 17 years."

The only restriction here placed upon the patent granted in this country for an invention patented abroad and not in previous use here for more than two years, is the limita-

tion as to the time of its duration. The requirement is not made that the American patent shall be limited to the same matter covered by the foreign patent; and in view of the wide difference in the modes of examination, especially between England and this country, it would be entirely impracticable, in the majority of instances, to attempt to confine the American patent to the precise matter covered by the foreign patent.

Occasionally the same subject matter, with immaterial variations, will be included in the domestic application.

In such cases the direction of the statute should be followed, and the patent "limited to expire at the same time with the foreign patent, and not in any case exceed a term of 17 years. (Weston vs. White, 9 *Official Gazette*, 1196.)

In restricting the grant in these cases, calculation should be made of the length of time the foreign patent has to run from the date of its issue here, and the limitation in the title be made accordingly.

To facilitate the proper restriction to be made in the grant where the domestic patent

Thus, the sixth section of the act of 1839 provided that in all cases of this kind the domestic patent should be limited to the term of 14 years from the date or publication of such foreign letters patent. This proviso was amended by the operation of the sixteenth section of the act of 1861, to the extent that patents thereafter granted and embraced within such proviso should extend for the new term of 17 years from the date of the foreign patent. But the act of 1870 (and the revised statutes) provided that the American patent should expire at the same time with the foreign patent, and not in any case exceed a term of 17 years. (Weston vs. White, 9 *Official Gazette*, 1196.)

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To facilitate the proper restriction to be made in the grant where the domestic patent

pedo. But the extreme exactitude necessary to effect this result was such that it would be very difficult to calculate upon. To pass through three-quarters of a mile of still water the torpedo required about five minutes, during which it moved in a straight line at the same level, with constantly diminishing speed. If it were accurately aimed, disturbed by no cross current, projected from a stationary place of discharge, and the object aimed at did not move during the passage of the torpedo through the water, it would hit. These conditions of warfare could obviously not be realized. It was objected that the Whitehead torpedo was too costly to be fired at random, and that a combination of submarine movement and of the power of modifying or directing that movement from the point of discharge was required to make a locomotive torpedo a really formidable weapon. Such a combination was proposed by Captain Ericsson toward the close of the war of the rebellion,

feet in diameter. At each end it is conical in form, one cone, the after one being nine feet long and the forward cone four feet long. The forward cone contains the magazine, which may be 100 pounds of dynamite or any other explosive material selected, although dynamite is considered most available. The torpedo contains its own motor, is propelled by an engine and screw worked very much as a propeller is worked by steam. The motive power is a gas which is compressed, and which in escaping operates the engine. By means of a light cable, which is attached to the torpedo the engine is started and stopped at the will of the operator, and the rudder is used in the same manner. Three keys playing upon a battery on shore stop or start the engine, or turn the torpedo to port or starboard. Before starting, the torpedo may be arranged to explode by concussion or by electricity at the option of the person in charge. It may be launched from the side of a vessel by men, as it weighs but a ton, or can be lowered by davits. It is ballasted to sink two or three feet below the surface, as needed, and when submerged it can be traced in its course by means of two rods which project slightly above the water. It is claimed that in experiments already made with it has been found possible to direct it accurately to a small object three miles distant from the point of its departure. It can travel at the rate of 12 miles an hour for three miles, the experimental torpedo being limited by its size to the storage of gas sufficient to operate it only for that distance. Vessels which are protected with a netting would not be safe against attacks from a torpedo of this description. Having made a breach in the netting, a second torpedo could be directed precisely through the breach against the hull, where the charge of dynamite could be discharged with terrible effect. An exhibition of the torpedo was given at Cleveland, Ohio, on Monday, when a stake boat or buoy was anchored three-quarters of a mile from shore, and the torpedo sailed under water out to and around it, and a canister of gunpowder was discharged by means of the battery on shore, to show the manner of using the weapon. The engine has already been examined by one of the belligerent powers, and soon of them will be shipped to Europe. It remains to be seen whether, in actual warfare, its usefulness will be as great as is anticipated by its inventors that it will be.

**Separation of Arsenic from Cobalt and Nickel.**—Most of the common ores of nickel and cobalt contain a considerable quantity of arsenic, and perhaps on this account the crude metallic arsenic is sold in drug stores under the name of "cobalt." The usual method of dissolving the ore, and precipitating the arsenic by sulphureted hydrogen, is objectionable on account of the disagreeable odor and poisonous properties of this gas. Professor Wohler avoids this inconvenience by the use of oxalic acid. The ore, *kufer nickel* or *speiss cobalt*, is dissolved in aqua regia, evaporated, if necessary, so as to expel the excess of acid, and precipitated while boiling hot with carbonate of soda. After washing, the still moist precipitate is treated with an excess of a concentrated solution of oxalic acid. Both metals are thus converted into oxalates, while the arsenic acid goes into solution along with the oxide of iron. The mixture of nickel and cobalt oxalate is thoroughly washed, and may be separated by ammonia according to Langier's process. If the ore contains copper, it should be precipitated by means of finely divided metallic iron that has been reduced by hydrogen. The dissolving iron must afterward be oxidized to a ferric salt. Speiss cobalt can be deprived of a large portion of its arsenic by previous fusion, care being taken to conduct the operation in such a manner as to prevent injury from the poisonous white arsenious acid evolved.

**Creosoted Timber.**—The Boston Post says: Mr. Edward B. Andrews, of this city, has leased a large tract of land in South Boston for the purpose of erecting thereon works for creosoting lumber. Wood whose pores have been thoroughly impregnated with creosote will never decay. The treatment with creosote was attempted in Boston some years ago, but the works were insufficient for the purpose. Yet the timber creosoted at that time, although imperfectly treated, has in most cases given satisfaction, and is to-day, after five or six years' test, perfectly sound, as can be seen in a part of the wooden pavement on Columbus avenue. At the French Exposition of 1867 sleepers were exhibited which had been in wear on English roads since 1838, and yet were perfectly sound. The principal tank or receiver in which the wood is to be treated is to be one-half inch iron, cylinder 100 feet long, 6 feet diameter, and warranted to stand a working pressure of 200 pounds to the square inch. The receiver will hold nearly 26,000 feet of lumber. The works will be completed about August 1.

The mechanic should not try to make, or have made, tools out of old files. They generally cost more than they are worth. If he is going to make a tool he should buy a good piece of steel of the proper shape, and the time and labor saved and the quality of the tool will more than make up for the cost of the material. In general, when a tool can be bought already made it is better to do so than to have it made. This is especially true of tools in common use.



PORTABLE ENGINE BY THE AMES IRON WORKS.

ifications, if the matter is separately claimed, of the part patented abroad, particular reference being had to the date and number of said foreign patent. Where the proper restriction in the grant can be accomplished by a division of an application which may be composed of several foreign patents of different dates, such division should be required where the subjects matter of the separate foreign patents are not used to form a combination in the domestic application.

Section 4887 must be regarded as establishing an exception to the requirement of Section 4884, providing that every patent shall be for the term of 17 years.

The act of 1870 did not require, in terms, a limitation of the grant, but simply provided that the domestic patent should expire at the same time with the foreign patent granted for the same invention. But the revised statutes, in requiring that the domestic patent "shall be so limited as to expire," &c., seems to imply that the limitation shall appear upon its face.

It may be contended, as was held in the O'Reilly and Morse case (15th How.), that a patent not so limited on its face would not necessarily be invalid, although not exempt from the operation of the statute; still, as the present statute is mandatory in its terms, and its object is the protection of the American public by giving to it a foreign invention no longer monopolized abroad, it is deemed the duty of the office in all practical cases to comply strictly with the letter of the law and make the limitation in the grant.

It has been held, also, that the act of 1870 introduced a new principle as to this matter,

is to be limited, examiners should enter on the file wrapper, upon the allowance of a patent, the fact that a foreign patent has been granted, and the date of the same, or, if more than one, the date of the earliest to expire.

The case in hand will be disposed of in accordance with the above suggestions.

### A New Submarine Torpedo.

The outbreak of the war between Russia and Turkey stimulated to a wonderful degree the ingenuity of men whose minds had been turned to the construction of weapons offensive and defensive, but it has been particularly fruitful of designs and models of instruments for harbor warfare. In England the subject of torpedo defenses for the protection of harbors has been at no time neglected during the last ten years, and several very valuable discoveries have been the result of experiments by private persons and by the officers of the government. The topic has been fruitful one for the newspapers. A short time ago one of the leading London journals, in referring to an article on submarine warfare, in a New York paper, spoke of some of the requirements that were still lacking in the best torpedoes. There seemed to be little to ask for in the way of fixed torpedoes. The submarine fish torpedo was spoken of as one which had reached great perfection, and there appeared to be no doubt that under favorable circumstances it could be so handled as to destroy a ship at a distance of half a mile or somewhat more from the point of discharge of the tor-

pedo. But the extreme exactitude necessary to effect this result was such that it would be very difficult to calculate upon. To pass through three-quarters of a mile of still water the torpedo required about five minutes, during which it moved in a straight line at the same level, with constantly diminishing speed. If it were accurately aimed, disturbed by no cross current, projected from a stationary place of discharge, and the object aimed at did not move during the passage of the torpedo through the water, it would hit. These conditions of warfare could obviously not be realized. It was objected that the Whitehead torpedo was too costly to be fired at random, and that a combination of submarine movement and of the power of modifying or directing that movement from the point of discharge was required to make a locomotive torpedo a really formidable weapon. Such a combination was proposed by Captain Ericsson toward the close of the war of the rebellion,

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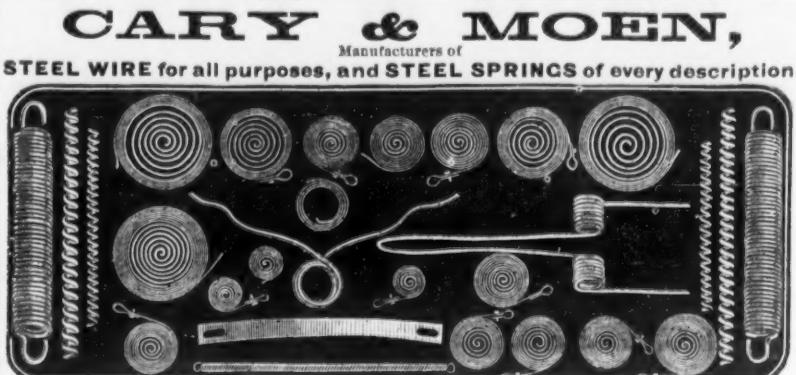


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#### Notes on the Iron Resources of Tennessee.

We have received from the Iron, Coal and Manufacturers' Association, of Chattanooga, a pamphlet on the agricultural and mineral wealth of Tennessee, by Col. J. B. Killebrew, from which we take the following:

From the most trustworthy information the iron production of Tennessee, charcoal and stonecoal, since 1871, is as follows:

| Bituminous   | Charcoal. Coal and Coke. | Total  |
|--|--------------------------|--------|
| Tons.  | Tons.                    | Tons.  |
| 1872 . . . . . 34,094                                    | 8,360                    | 42,454 |
| 1873 . . . . . 34,532                                    | 8,602                    | 43,134 |
| 1874 . . . . . 37,227                                    | 11,543                   | 48,770 |
| 1875 . . . . . 18,011                                    | 10,300                   | 28,311 |
| Number of stacks completed :                             |                          |        |
| 1873 . . . . .   | 20                       |        |
| 1874 . . . . .   | 21                       |        |
| 1875 . . . . .   | 21                       |        |
| Number of stacks in blast, December 31, 1875 . . . . . 7 |                          |        |
| Number of stacks out of blast . . . . . 14               |                          |        |
| Rolled iron, excluding rails :                           |                          |        |
| 1873 . . . . .   | 2,588 net tons           |        |
| 1874 . . . . .   | 1,573 " "                |        |
| 1875 . . . . .   | 1,005 " "                |        |
| Cut nails and spikes—kegs :                              |                          |        |
| 1874 . . . . .   | 13,210                   |        |
| 1875 . . . . .   | 9,795                    |        |

About 50 tons of hammered iron are made annually in eighteen Catalan forges. Railroad iron is made only at Chattanooga in one establishment, which turned out 12,250 tons in 1875.

There are four distinct iron belts or areas in the State of Tennessee, occupying in whole or in part forty-four counties, excluding the Cumberland table-land.

1. The Eastern Iron Belt extends through the State, and lies mainly in front and at the base of the Unaka Mountains.

2. The Dyestone Belt skirts the eastern base of the Cumberland table-land, or rather of Walden's Ridge, from Virginia to Georgia; spreads out laterally from ten to twenty miles into the Valley of East Tennessee; the Sequatchee and Elk valleys are included.

3. The Cumberland table-land is extensive with the coal measures of the State, and extends into Kentucky and Alabama.

4. The Western Iron Belt lies west of Nashville, or, say, west of the Central Basin.

**The Eastern Iron Belt.**—This belt embraces the extreme eastern tier of counties, viz: Johnson, Carter, Washington, Greene, Cocke, Sevier, Blount, Monroe, McMinn and Polk; to these we may add Sullivan, which adjoins this belt on the northwest.

Along the North Carolina line is a great double range of mountains, constituting one of the natural divisions of the State, and denominated the Unakas. This range of mountains consists of several long, high, parallel ridges, intersected by deep cuts or chasms, through which the Watauga, Nolichucky, French Broad, Big Pigeon, Little Tennessee, Hiwassee and Ocoee rivers flow out of North Carolina and Georgia into this State. A part of this range is called Smoky Range. The ore banks of the Eastern Iron Belt lie mainly to the northwest of this Smoky Range, some of them, however, occurring in the valleys and coves between the more westerly ridges.

The most important ore found is what mineralogists call limonite, a compound of iron, one form of which, common iron rust, is well known. In nature it is found in all sorts of forms, sometimes as yellow powder, which, when mixed with clay, is "yellow ochre;" sometimes as a porous, sponge-like mass, called honeycomb ore; again in a compact, hard stone-like condition. It not unfrequently occurs in curious stalactitic forms, and often in hollow balls, or "pots," sometimes open, dark, lustrous and sluggy in appearance, occasionally with an iridescent play of colors. In all these forms, however, it retains the simple chemical composition of ordinary iron rust. That composition, when the mineral is pure—that is to say, when there is no clay, or sand, or other foreign substance mixed with it, which, by the way, is usual—is in percentage numbers as follows:

|                  |       |
|------------------|-------|
| Iron . . . . .   | 59.92 |
| Oxygen . . . . . | 25.68 |
| Water . . . . .  | 14.40 |

100.00

It contains, therefore, when pure, very nearly 60 lbs. of iron to the hundred. Practically, owing to the presence of impurities, and losses in the reduction, it never yields so much.

The purest possible limonite, or brown hematite, cannot possibly contain more than sixty per cent. of pure iron, the assertions of mineral enthusiasts to the contrary notwithstanding, unless it has undergone the process of roasting, whereby the water is expelled.

This ore does not occur in regularly stratified beds like the dyestone, to be mentioned, nor in true veins like many other metalliferous minerals, but is met with in irregular masses of all sizes, from small lumps (shot) up to blocks ten or fifteen feet in diameter. The matrix is composed of clay, gravel and decomposed rock. A spot of ground, (it may be a knoll, part of a ridge, or part of a mountain slope), in which the ore is discovered by digging, is called a bank. A bank may be defined to be an area beneath which lies a considerable depth of clay, sand and rocky debris, interspersed with which iron ore (limonite) is to be found in greater or less quantity, the ore presenting itself, as stated, in irregular masses. The banks differ much in quantity of ore—some are said to be rich; others are poor, requiring the removal of much foreign matter; others, again, are little else than clay and debris—all require the removal of more or less dead matter before the ore can be obtained. In many banks great excavations, mostly open to the day, have been made, into which large buildings might be thrown. The banks, although in some cases a hundred feet in depth, are superficial formations, and rest upon stratified limestones, shales and other rocks. As may be inferred, mining in such banks is rather an uncertain business, both as to the quantity and the exact position of the ore. Nevertheless, the best of them yield an abundance of mineral.

In a given valley, or on a given ridge, there may be from one to a dozen banks, the latter of any length from a hundred yards to

a mile. In the Eastern Belt, banks occur in all the counties. Johnson and Carter contain many of them, some of which are exceedingly valuable.

In Bompass Cove, Washington county, are immense deposits of limonite iron ore. These banks are very rich, and are found in knolls, hills and ridges, which rise above the level of the valley from 50 to 250 feet. The matrix is a deep brown, or chocolate colored earth, and the ore occurs in masses of all sizes, from small grains up to lumps as large as a sugar hoghead. Some of the ore contains lead and zinc, and also iron pyrites.

The limestones and dolomites of the region also contain galena in disseminated grains, and at one point the galena is so abundant that it has been worked as a lead mine; the machinery, however, has gone to ruin. As to the amount of iron ore in this cove no proper estimate can be made, but there is but little doubt that it is practically inexhaustible. And this cove is but a type of the numerous coves which occur from Johnson to Polk.

In Greene county there are very good banks. Two large furnaces have been erected in this county since the war. The ore yields from 40 to 50 per cent. of tough gray iron. That used at one of the furnaces in this county is obtained by running a drift 750 feet into one of the hills about 1000 feet from the furnace. At this distance a mass of almost solid ore, with a matrix of white chalky earth is found, so easily obtained that twelve men get out thirty car loads a day, weighing each 3000 pounds. The screenings of the ore amount to 2-3 of the whole, and of the screenings about two-thirds is good ore. The drift passes through 600 feet of dolomite, which dips at an angle of 45°. The deeper the excavations the better the ore. It is said, however, to be more refractory than the same kind of ore found in Stewart, Montgomery and other counties of the Western Iron Belt.

Limonite, as has been stated, is the principal ore of this belt. In addition to this, the black ore of iron, magnetite of the mineralogists, occurs at one point at Crab Orchard, near the North Carolina line in Carter county. How much of this there may be we are not able to state. Much excellent bar iron has been manufactured from it in a common bloomery. In Sullivan county, in addition to the limonite banks, are banks of red ores, hematites. The Crockett and Sharp banks afford this variety, and are capable of supplying much good ore. In McMinn county is a remarkable deposit of stratified red ore, which, on account of its proximity to the Unaka Range, we include in the Eastern Belt. This is Hill's Bank. The ore is a stratified, fossiliferous rock, much like the ore of the Dyestone Belt, to be mentioned. This bed of ore is noticeable from the fact that it belongs to the Lower Silurian series, while the Dyestone belongs to the Upper Silurian. The main outcrop is a third of a mile or more in length, and at some points 50 or 60 feet wide.

A similar ore of the same age outcrops in the red hills, just south of the railroad between Philadelphia and Sweetwater. It is accompanied by good manganese ore. The thickness of the bed has never been ascertained, but the abundance of surface ore appears to indicate workable amounts. Hematite, in the form known as specular iron, occurs in the eastern edge of Cocke county, in beds to feet or more in thickness. The ore is pretty constantly mingled with quartz and feldspar, which are sometimes present in such quantities as to make it worthless, but other portions contain no more silica than can readily be fluxed off in the furnace. The special interest of the ore consists in its extremely small content of phosphorus, only six thousandths of 1 per cent., according to analyses made by Prof. O. D. Allen, of the Sheffield Scientific School, one of the best analysts in the country. The ore is plainly well fitted for making the best grades of Bessemer steel.

The Tellico ores in Monroe county are varied. The limonite is most abundant, but there are a few localities where the hematite and magnetite are found. The hematite ore is so compact that blasting powder is used in raising it. It is very pure, having a few seams of yellow ochre and white chalky earth.

Shot ore is likewise found in this vicinity. Donnelly's Bank is the name of the principal deposit of this ore. A tunnel has been driven into a ridge, and for a while large quantities were taken out that yield in the furnace 50 per cent.

Many years ago the immense masses of brown hematite which cap the copper veins at Ducktown, in Polk county, attracted the attention of iron men. Many attempts were made to work it, but the small percentage of copper ore present made the iron worthless. Time may develop processes by which it can be made available, but at present the quality of iron is what is called "red-short," and is almost worthless for any practical purposes.

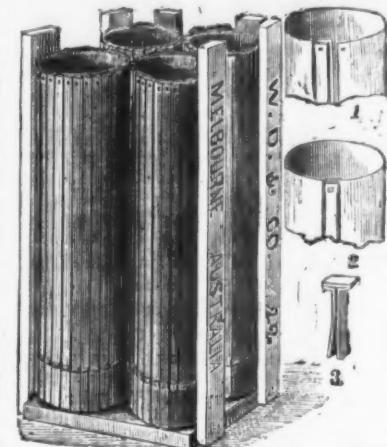
The cost of making iron in the eastern iron belt has been definitely ascertained at two of the furnaces. The furnace at Emeryville (now out of blast) is cold-blast charcoal, with two tuyeres driven by water-power. The ore is brought from banks at the foot of Bompass cove, three miles south of the furnace, and delivered in the furnace at two dollars and fifty cents per ton. Charcoal is burned by contract at five cents per bushel, and delivered at six and a half cents. Good reliable labor can be procured for one dollar per day. The estimate is two tons of ore, and 150 bushels of charcoal for one of iron.

At the Unaka Furnace, in Greene county, all the work except that done by the immediate furnace hands, is done by contract. Coal is burned and delivered at prices varying from 6 cents to 7½ cents per bushel, according to the magnitude of the contract, the highest price being paid on the largest contracts. Though owning rich banks of ore, the proprietor has been supplied by outside parties, who are paid \$5 for every ton of iron made from the ore delivered, or a little less than \$2.50 a ton for ore. Wood privileges are purchased at 5 cents per cord or \$2 per acre.

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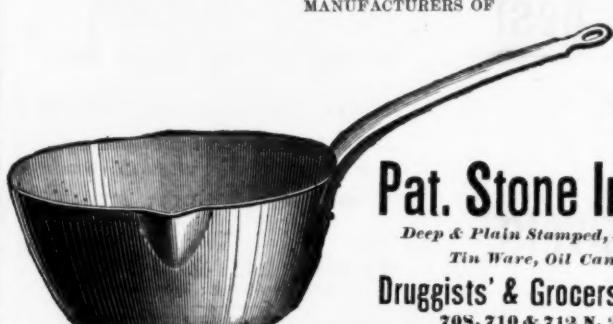
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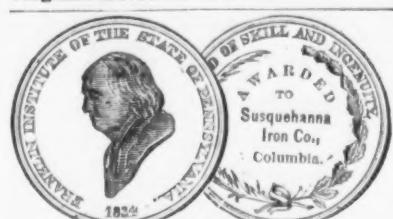
| Iron.  | Iron.  | Iron.   | Iron.  | Iron.  |
|--|--|---|--|--|
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## New Patents.

We take from the records of the Patent Office in Washington the following specifications of certain patents lately issued, which will be found interesting:

## IMPROVEMENT IN PROCESSES OF CONVERTING

CAST IRON INTO CAST STEEL.

Specification forming part of Letters Patent No. 189,273, issued to Charles William Siemens, of Westminster, England.

This invention relates to the methods and means made use of for converting cast iron into cast steel; and the nature thereof consists in pouring, tapping, or otherwise conveying the furnace charge into a heated ladle lined with refractory material, and containing rich ferro-manganese in a solid condition, and thereby preventing the ferro-manganese from oxidizing, and insuring a definite proportion of manganese in the metal produced.

We quote as follows from the specifications:

My improvements may be applied to various processes now in use for refining cast iron, and therefore I do not confine myself to the particular means and methods of decarbonization hereinbefore set forth, but merely describe them in order to illustrate the applications of my invention.

When my improved methods are applied to the regenerative gas furnace, a bath of cast or pig iron is first brought to a high temperature by the action of the flame.

Upon the bath thus heated either ore, puddled steel, scrap iron, or old rails, may be thrown, charged or otherwise introduced. When ore is thus used it may be previously cemented and roasted before being charged into the bath. When it is intended to convert old iron or steel rails, or other scrap metal into cast steel, I prefer to charge into the furnace, say, about three tons of scrap, intermixed with two tons of comparatively pure pig metal, and to continue firing until the whole charge has become a fluid mass. The degree to which the bath has been refined is determined by drawing out and ex-

amining a sample of the bath, and more

scrap metal, or metallic oxide, or ore is

added until the samples show the requisite

percentage of carbon, when the whole is

discharged into a heated ladle containing

ferro-manganese, as hereinbefore described.

The entering or issuing gaseous currents

pass through valves not shown.

The heating chamber where the metallurgical processes are carried on has its roof

and sides constructed of highly refractory

materials such as best silica or Dynas bricks.

The bed is usually made of sand, but in

some cases an oxide of iron bottom is prefer-

able.

Below the center of the furnace is an open

cave through which air freely circulates, and

rises through openings into the air space be-

low the melting chamber and behind the

bridges, whereby a perfect cooling of the

sides of the melting chamber is effected.

This cave serves, moreover, as a receptacle

for the waste gases from the furnace.

The entering or issuing gaseous currents

pass through valves not shown.

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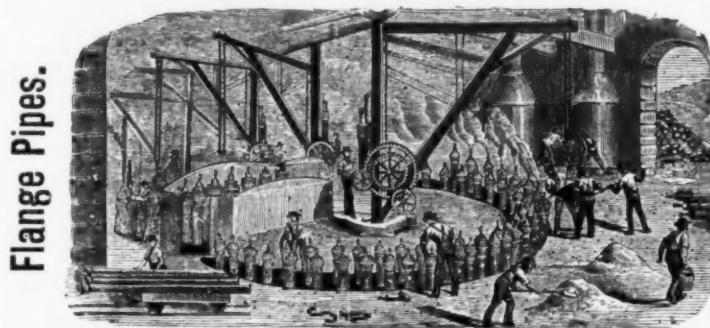
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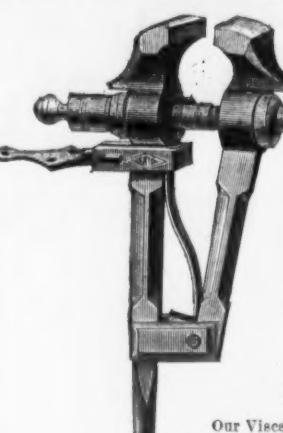


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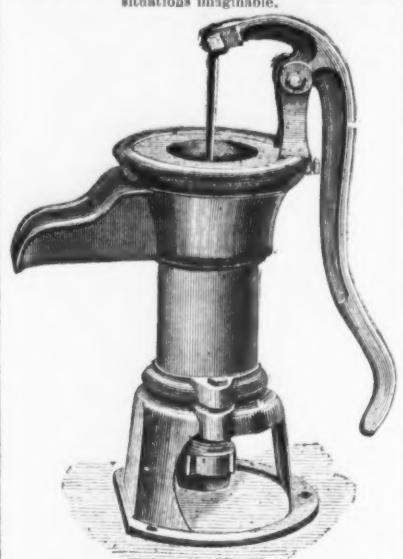
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Universal Force Pumps.

Secured by Letters Patent.

These Pumps have enormous power, and are for the house or for out-door wells of any depth. They are constructed with a view to strength, ease of working and durability. They can be immediately changed from lift to force pumps, and the air can be admitted to the pump to work at any desired angle with the spout. Having close tops, they can be taken apart with ease. Attention is called to our new elegant pattern **Deep Well Non-Freight Iron Pump.** Also, **Drain and Vacuum Chambers** — a complete protection against sand or gritty water in dug or driven wells, making them safe for home or steam pumps, all sizes, from 1/4 inch to 4 inch suction pipe. Send for circulars to

**A. M. MFG. CO.,**  
71 Fulton and 71 Beckman St., New York.  
Western Agency — Newton & Hough, 100 Broadway, San Francisco, Cal.

Send for Illustrated Catalogue and  
Price List.

Single Action.

Double Action.

**The Oldest Shot Tower in America.**  
FOUNDED JULY 4, 1808.

**THOMAS W. SPARKS,**  
Manufacturer of

American Standard Drop and Buck

Shot and Bar Lead.

121 Walnut Street, Philadelphia.

Premier awarded by the Judges of the Centennial

International Exposition for uniformity and general  
good finish of Pellets.

Established in 1836.

**Shelton Company,**

Manufacturers of every variety of

**TACKS & SMALL NAILS,**

Carriage, Machine, Pile, Stove and

Tire Bolts, Coach Screws,

Bed Screws, &c.

BIRMINGHAM, CONN.

**Babcock's Sash Fastener,**

PATENTED JAN. 11, 1874.

Needs but to be seen to be Appreciated.

Send for Circular. Sample, 30c.

**C. P. BABCOCK, Portland, Me.**

State Rights For Sale.

**Japanese Paper Ware.**

Centennial Award

to

**Jennings Bros.**

for the manufacture of the

Japanese Paperware, Water Pails, Chamber and

Commode, do. (Slop Jars, Foot Bells and Water Car-

riers, Bowl and Pitcher,

Pans, Basins, Cuspidores, Spittongs, &c., &c.

Warehouse, 372 Pearl St., N. Y. City.

Trade supplied.

**CARRIAGE**

**SPRINGS.**

JOHN H. RECK, PASSAIC SPRING WORKS,

Manufacturer of Railroad Car, Locomotive, Omni-

bus Platform and every variety of Carriage and Buggy

Springs, 72 to 280 Passaic St., Newark, N. J.

Lock Box 105

Also sold by leading wholesale houses.

**THE IRON AGE.**

[Continued from page 3.]  
**Notes on the Iron Resources of Tennessee.**

the furnace will average about 53 per cent., and the amount of charcoal used for a ton of pig metal will average about 120 bushels. The furnace is hot-blast, with three tuyeres, the blast being driven by a 65 horse-power steam engine, the surplus gas from the tunnel head being used to generate steam. The circle at the bottom of hearth is 44 inches; height of tuyeres from bottom of hearth, 24 inches; inclination of bosh, 60°; width, 9 feet 3 inches; height of stack, 32 feet 5 inches; size of tunnel head, 21 inches. The following will show the cost of making 9 tons of pig metal, being one day's work:

|  |         |
|--|---------|
| Ore for 9 tons at \$5.....   | \$45.00 |
| Actual expense to put in furnace, including roasting, washing, etc. .... | 15.25   |
| All furnace hands, including engineers, salaried officers, etc. ....     | 17.50   |
| 840 bushels coal at 7 cents.....   | 58.80   |

8136.55

One-ninth of which is.....

15.17

To this should be added the interest on investment, say, \$1 and \$5, the cost of delivering to Greeneville, making the whole cost delivered on the railroad \$21.17. But, as the work is nearly all paid in goods, upon which a profit of from 30 to 100 per cent. is realized, it brings down the actual cost to very low figures, not more than \$15 per ton in money delivered on the railroad.

Potsdale Furnace, within two miles of the Unaka, is out of blast. It used ore from the same banks and had a capacity of about 6 tons per day.

The quantity of iron made in the eastern iron belt is small, on account of the inadequacy of railroad facilities. While the quantity produced in this region will not exceed 7000 tons annually, the capacity of the furnaces is equal to the production of 15,000 tons.

This charcoal, cold-blast iron is very superior. Its chilling properties are just such as to make it most suitable for the manufacture of car wheels, and nearly all the iron made in this region is consumed in Knoxville and at other points for that purpose.

It has been pronounced equal to the best made anywhere for car wheels, axles, locomotive tires, and, indeed, for everything in which toughness, elasticity and strength are required. A fair test was also given to this iron at West Point, for armory purposes, and proved entirely satisfactory.

**The Dyestone Belt.**—This belt of iron ore is remarkable for its length and richness. It skirts the eastern base of the Cumberland Table land, and extends from Chattanooga to Cumberland Gap, a distance of 100 miles. The following counties, or parts of them, are embraced within this belt: Hancock, Claiborne, Grainger, Union, Campbell, Anderson, Roane, Rhea, Meigs, James, Bradley and Hamilton. The belt includes the Sequatchie and the Elk Fork Valleys, which places parts of Marion, Sequatchie and Blount counties within its area.

The chief ore of this belt is a stratified red iron rock, called at many points Dyestone, being sometimes used for dyeing purposes.

It is highly fossiliferous. Like a limestone, or a bed of coal, and unlike the limonite of the eastern belt, it occurs in layers. Its quantity, in any given locality, can therefore be estimated, and the result of a given amount of mining can be calculated with some precision. As a mineral species, the ore is a variety of hematite, which in plain English is bloodstone, the word referring to the color of the ore. If we take common iron rust and burn it, we obtain a red rust, the change being brought about by the expulsion of water simply. Common brown or yellow iron rust is then limonite, the same burned is red hematite. By the burning more than 14 per cent. of water is expelled. The composition of hematite is as follows:

|             |    |
|-------------|----|
| Iron.....   | 70 |
| Oxygen..... | 30 |

100

One hundred pounds of the pure ore might be made to yield 70 pounds of iron, but, as in case of limonite, the impurities defeat this maximum production. In practice from 40 to 50 per cent. (and rarely 60) may be regarded as a good yield. The ore usually soils the fingers readily. At some points it is hard and is quarried out in blocks; occasionally it is soft and easily crushed. The impurities in it are sandy and argillaceous matter and carbonate of lime. Originally much of it contained limestone matter, this having been in the course of ages leached out, leaving red layers as we now find them.

One, and at many points, two or more layers of dyestone outcrop at the eastern base of the table land, almost without a break, throughout its whole extent from Virginia to Georgia. Also in many of the minor ridges, lying from one to ten miles from the table land, but running parallel with its eastern border, are other outcropping layers. The latter will perhaps, in the aggregate, equal an outcrop extending continuously through the State and following the direction, as above, of the outline of the table land. In addition there are lines of outcrops in Sequatchie and Elk Fork valleys. Elk Fork Valley is in the extreme northwestern part of Campbell county. One of the richest deposits of this ore occurs within a few hundred yards of Cumberland Gap, and extends without a break twenty miles along the mountain, and is half a mile in width. It forms a regular stratum of Walden's Ridge, four feet beneath the surface and varies from eighteen inches to three feet in thickness. This stratum is parallel with the slope of the ridge, and forms a complete sheet or shield, with an overlying stratum of clay, sand and gravel. The ore is raised with powder and thrown out in large, broad sheets. It is very hard and massive. The whole cost of raising this ore at Cumberland Gap and depositing it in the bridge loft ready for smelting, is \$1 per ton. This fact will be appreciated by the reader when he reflects that ores delivered ready for smelting in the Pittsburgh furnaces cost from \$8 to \$12 per ton. On the spurs which shoot out from the Cumberland table land are deposits of limonite iron ore of superior excellence, yielding from the furnace 50 per cent. This ore caps the hills, forming a ledge with intermingling gravel from sixteen to eighteen feet in thickness. Some of these beds are said to have an unusually small

100

One hundred pounds of the pure ore might be made to yield 70 pounds of iron, but, as in case of limonite, the impurities defeat this maximum production. In practice from 40 to 50 per cent. (and rarely 60) may be regarded as a good yield. The ore usually soils the fingers readily. At some points it is hard and is quarried out in blocks; occasionally it is soft and easily crushed. The impurities in it are sandy and argillaceous matter and carbonate of lime. Originally much of it contained limestone matter, this having been in the course of ages leached out, leaving red layers as we now find them.

|               |
|---------------|
| Iron.....</td |
|---------------|

## USE THE BEST.



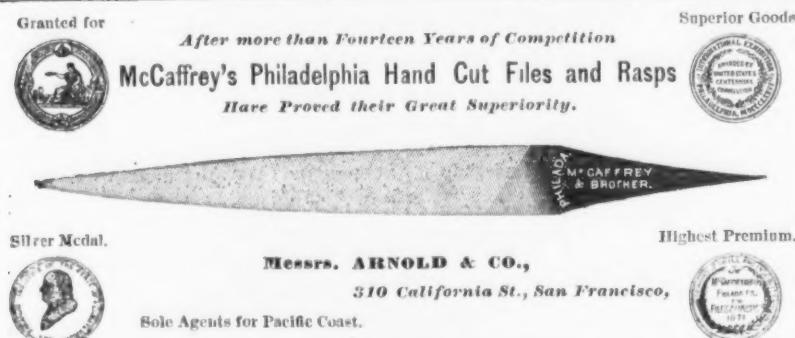
Pawtucket, R. I.

The American File Company have the exclusive right to use the Bernot process for cutting files. By this method all the advantages of hand cutting are secured, together with an accuracy unattainable in hand work. They are the only manufacturers who employ machinery for testing files and steel.

Goods of all known manufacturers have been repeatedly tested, and interesting tables have been compiled showing the working qualities of files made by different makers, and of files made from different steels, and with various shapes and angles of tooth. They have thus reduced the manufacture of files to an exactness and perfection with a uniformity of result, as they believe, never before attained. No file, foreign or domestic, that they have ever tested, has equalled the performances of their own goods taken at random from their stock. Their machines are capable of the most delicate adjustment, and can produce the very finest work known to the trade. Special files made to order. Prominent file manufacturers are having their best goods from our works.

Price lists and information furnished on application.

AMERICAN FILE CO., Pawtucket, R. I.



**AUBURN FILE WORKS,**  
Superior Hand-Cut  
**FILES AND RASPS,**  
MADE FROM IMPORTED STEEL. EVERY FILE WARRANTED.  
**FULLER BROS., Sole Agents,**  
89 Chambers and 71 Reade Streets, N. Y.

ESTABLISHED 1848.



**PATENT**  
**WROUGHT IRON SHEAR.**

When not in use occupies a space 6x30 inches, and in use the same space with sufficient room to bring down the lever. Weight 180 pounds. Knives have no holes in them, and can be taken out in three minutes. Can be renewed at the mere cost of the steel. One set of knives should last several years. Guaranteed to cut, readily, Iron Bars 4x3, 6x4, 13/4 round, 13/8 square; will also cut Plow Steel.

We offer them at \$200 each, with a liberal discount to the trade.

**BROWN & CURTISS,**  
MANUFACTURERS OF  
Patented Wrought Iron Wagon Hardware  
AND  
SPECIALTIES IN WROUGHT IRON,  
Cleveland, Ohio.

**GOLD MEDAL**  
**Non-Extensible Razor Belt.**

PATENTED JULY 25, 1871.  
RE-ISSUED MAY 13, 1873, and JUNE 9, 1874.

In this strap the liability of the leather to stretch and become loose and porous is prevented by the use of a patented non-extensible base, which supports the leather and secures

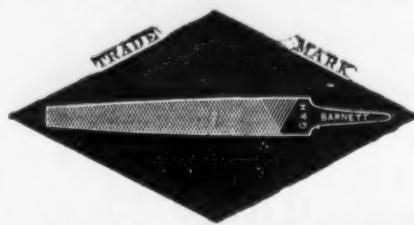
PERMANENT ELASTICITY.

We make this style with single rod, double rod, and wood frames, and intend that it shall, in quality compare favorably with our other well known brands.

BENJAMIN F. BADGER &amp; SON, Manufacturers,

Badger Place, Charlestown, Mass.

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Send for Illus.  
trated Price List.Send for Illus.  
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39, 41 &amp; 43 Richmond St., Philadelphia.

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THOS. TAYLOR, 43 Chambers St., N. Y., Agent for N. Y. and N. E. States.

THOS. JOWITT &amp; SONS, SHEFFIELD,

Manufacturers of every description of

FILES.

Forged, Ground and Cut by  
Hand and Tempered by an  
Improved Process.

CORPORATE MARK

ROLLERS, TILTTERS &  
FORGERS.CAST, SHEAR & BLISTER  
STEELImporters of  
SWEDISH and RUSSIAN  
IRONS.

For various purposes.

Granted according to Act of Parliament, and Registered in Germany and the United States.

MESSRS. RUSSELL &amp; ERWIN MFG. CO.,

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MESSRS. QUACKENBUSH, TOWNSEND &amp; CO.

San Francisco and Sacramento. MESSRS. FROTHINGHAM &amp; WORKMAN,

Montreal.

ESTABLISHED IN 1816.

NO CONNECTION WITH ANY OTHER HOUSE.

PETER A. FRASSE &amp; CO.,

No. 95 Fulton Street, New York.

AGENTS for the American Screw Co.'s Machine Screws and Taps.

SOLE AGENTS Thos. Turner &amp; Co.'s, Files, Horse Rasps.

" " Hubert's French Emery Paper.

IMPORTERS OF STUBBS' Files, Tools, Steel Wire.

" " GROBET'S Fine Swiss Finishing Files.

" " VAUTIER, NICOUD and RENARD Gravers.

" " JEWELERS' and Machinists' Supplies.

DEALERS IN Scroll Saw Machines, Bracket Saws, Wood and Patterns.

CHARLES B. PAUL,  
Manufacturer of HAND CUT FILES.Warranted CAST STEEL.  
187 Tenth Street, Williamsburg, New York.  
Established 1863.AUSABLE HORSE NAILS  
POLISHED OR BLUED.  
HAMMERED AND FINISHED

**The Ausable Nails**  
Are Hammered Hot,  
And the Finishing and Pointing are  
Done Cold,

Thus Imitating the Process of Making Nails by Hand.

Quality is Fully Guaranteed.

For Sale by all Leading Iron and Hardware Houses.

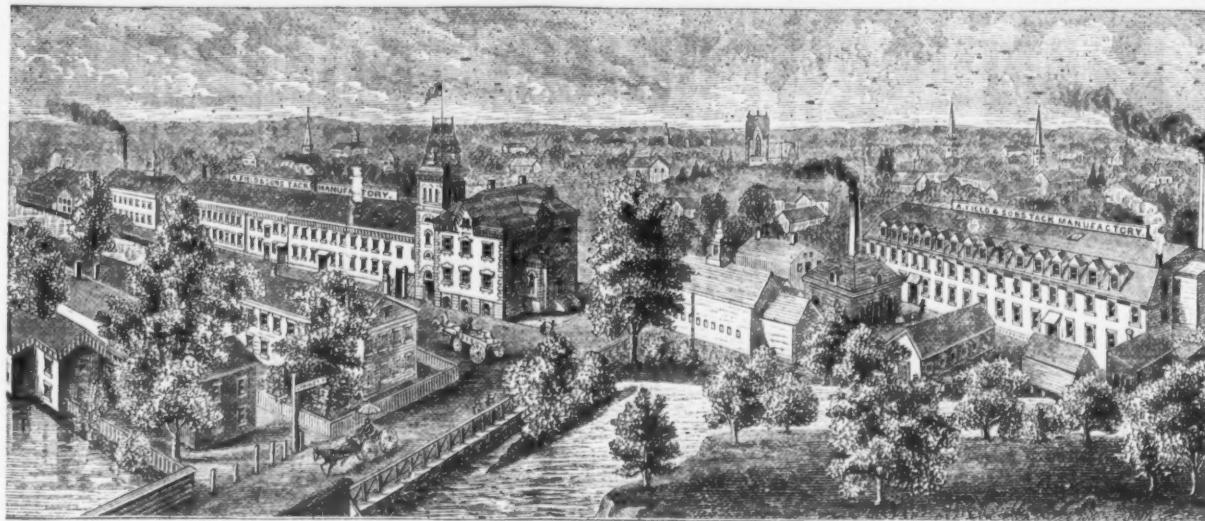
ABRAHAM BUSSING, Secretary,  
35 Chambers St., New York.Ten Eyck Axe Mfg. Co.  
COHOES, N. Y.Warehouse, 103 Chambers St., N. Y.  
Manufacturers of

AXES

Of all kinds.

Hatchets, Adzes, Grub Hoes, Mattocks and Picks.

Catalogues and Price Lists furnished upon application.



## A. FIELD & SONS, TAUNTON, MASS., Manufacturers of COPPER & IRON TACKS, TINNED TACKS, SUPERIOR SWEDES IRON TACKS, for Upholsterers' Use, Saddlers' Supply, Card Clothing, etc., etc.

### American and Swedes Iron Shoe Nails.

Zinc and Steel Shoe Nails, Carpet, Brush and Gimp Tacks, Common and Patent Brads, Finishing Nails, Annealed Trunk and Clout Nails, Hob and Hungarian Nails, Copper and Iron Boat Nails, Patent Copper Plated Tacks and Nails, Fine Two Penny & Three Penny Nails, Channel, Cigar Box & Chair Nails, Leathered Carpet Tacks, Glaziers' Points, Etc. OFFICES AND FACTORIES AT TAUNTON, MASS. WAREHOUSE AT 78 CHAMBERS STREET, N. Y., where may be found a full assortment of Tacks, Brads, &c., for the accommodation of the New York Wholesale and Jobbing Trade.

Any variations from the regular size or shape of the above named goods made from samples, to order.

**Hoisting** Machinery  
Manufactured by  
Crane Bros. Mfg. Co.,  
CHICAGO.

COOKE & BEGGS, Agents, 16 Cortlandt  
Street, New York.

**THE**  
**IRON CLAD**  
**Ice Balance.**  
200, 300, 400 lbs.  
Capacity.  
**CORRECT,**  
**COMPACT**  
and  
**DURABLE.**  
NOT LIABLE TO GET OUT  
OF ORDER.  
Universally Approved  
BY THE  
Ice Companies.  
Manufactured only by  
John Chatillon & Sons,  
89, 91 & 93 Cliff St.,  
NEW YORK.

**DROP FORGINGS**  
AND  
**Special Machinery.**  
Hardware & Tools and Specialties in Metals  
manufactured to order.  
HULL & BELDEN CO., Danbury, Ct.

**SILVER'S**

Waste Heat Utilizer and Ventilator.  
Is the problem solved? How to utilize waste heat from chimneys, establishing a system of warming and ventilating, based upon sound philosophy and economy. This apparatus requires less fuel when the room is ventilated than if not ventilated, a feature heretofore unknown in the history of heating appliances. For circulars and illustrations address  
L. B. SILVER, CLEVELAND, O.

### PRIZE MEDALLISTS:

London, 1862; Oporto, 1865; Dublin, 1865; Paris, 1867; Moscow, 1872; Vienna, 1873, and **only** Award and Medal for Self-Coiling Steel Shutters at Centennial Exhibition, Philadelphia, 1876.

**CLARK & CO.,**  
ORIGINAL INVENTORS AND SOLE  
PATENTEES OF

Noiseless Self-Coiling Revolving  
**STEEL SHUTTERS,**  
FIRE AND BURGLAR PROOF.  
Also Improved

**Rolling Wood Shutters**

Of various kinds. Clark's Shutters are the **Best** and **Cheapest** in the world. Are fitted to new Tribune Building, Lenox Library, Delaware and Hudson Canal Co.'s Building, Transatlantic Telegraph, New York, America's News Office & Post Office, County Court House, Mt. Vernon, Holt County Court, Oregon, Mo. Also to buildings in Boston, Cincinnati, Detroit, Janesville, Wis., Baltimore, Canada, &c. Have been for years in daily use in every principal city throughout Europe, and are endorsed by the **Leading Architects of the World.**

Office and Manufactury,

162 & 164 West 27th Street, N. Y.

### Improved Combined Sausage Stuffer and Fruit, Lard and Jelly Press.

The improved form which the Enterprise Manufacturing Company, of Philadelphia, have adopted for their combination sausage stuffer and fruit, lard and jelly press, merits the attention of the trade. The large size rack movement machine formerly made by the company and illustrated in our issue of August 31, 1876, did not appear to be as powerful as was desired, and to perfect the invention they designed the screw movement shown in the illustration herewith presented. This they guarantee to give full satisfaction and to exert an enormous power of pressure without requiring the exercise of much physical energy in working the screw. The machine is one of great practical value to farmers and others having use for anything of the kind, and has become one of the standard articles of trade since its introduction.

### A Tin Exhibition.

The Tin Plate Workers' and Wire Workers' Company, of London, have issued the subjoined circular:

SIR.—The master, wardens and court of assistants being desirous of holding an exhibition of tin plates, tin plate manufactures and wirework, we invite your co-operation,

ropes entirely of this alloy. Phosphor bronze ropes are said to have the advantage of offering great resistance to strains of traction, of being very pliable and inoxidizable, and of resisting any attack of corrosive water, while the wear due to the contact of the wires is less than in other metallic ropes; they also preserve their pliability after wear. These phosphor bronze ropes are used in Belgium, at the Bois-du-Duc, Horloz, and Courcelles-Nord collieries, among others.

### Col. Forney on Iron.

In his 4th of July oration at Philadelphia, Col. John W. Forney gave iron a "first rate notice," as follows:

"Take away gold and silver and the whole range of baser metals, leaving us iron alone, and we would hardly miss them. Take away iron and we lose what is next to life and that which sustains life, the greatest boon the Almighty has conferred upon man."

These words were spoken by the lamented Joseph Harrison, Jr., of this city, April 27, 1859, at a public dinner given to the memorable Henry C. Carey, still living, in his 84th year.

The variety of the uses of iron justified the eulogy of the scientific mechanic. These uses are almost infinite. Labor and art are the magicians that have plucked it from the earth and coined it into many adaptations;



COMBINED SAUSAGE STUFFER AND PRESS WITH IMPROVED SCREW MOVEMENT.

and shall feel obliged by your informing us at your earliest convenience if you are prepared to compete for the medals and other prizes to be offered. The following is an outline of the scheme proposed, subject to such modifications as may be deemed advisable after the following suggestions of the company have been considered by yourself and other representatives of the trades interested. The following articles, with such additions as may be decided upon, will be exhibited:

1. Tin plates—in single sheet specimens.
2. Tin-lined cases and casks for packing goods.
3. Cans, canisters, cases and other packages made wholly of tin.
4. Coffin furniture—say, six best designs made from I C coke plates.

5. Domestic utensils—not exceeding thirty pieces—to include dish covers, American ovens, roasters, jelly molds, bread tins, saucepans, coffee pots, hand bowls, patty pans, flour boxes, hot plates, dishes, strainers, fish kettles, candlesticks, lanterns, match boxes.

6. Japanned tin—plain, or in one color—twenty pieces—including traveling trunks, letter boxes, toilet sets, trays, artists' color boxes.

7. Decorated tinware—twenty pieces—including sets of trays, coal boxes, canisters, grocers' fittings, advertising.

8. Tin toys—twelve pieces.

9. Wirework—in iron, copper, steel, brass, gold, silver work—fencing wire, lattice wire.

10. Manufactured wire—including blinds and other wire gauze, netting, flower stands, bird cages, traps, fire guards, sieves, screens, fencing, wire nails.

It is proposed that exhibitors shall pay for the space occupied, and that prizes will be awarded to manufacturers consisting of the freedom of the company, medals and certificates. As soon as the views of the trade have been ascertained from the replies received in answer to this circular, some of the manufacturers will be invited to join the committee appointed by the court of assistants. Your early reply will be esteemed a favor by yours, faithfully,

S. P. LOW, Master;  
GEORGE OFFOR, Ex-master;  
W. C. ANDERSON, Upper Warden;  
F. E. WILKINSON, M. D., Renter Warden;  
F. W. REYNOLDS;  
C. JENKIN-JONES, Hon. Secretary.

May 15, 1877.

All communications to be addressed to the Hon. Secretary, 8 Buckingham street, Strand, W. C.

We are not informed whether the competition invited by this circular is restricted to British artisans, or whether Americans and other foreign tin makers are to be admitted. In many specialties we could carry off the laurels, especially in classes 5, 6, 7 and 8, and we are not sure but in 10 also. Our deep stamping beats the world, and in domestic utensils and Japanned ware we could make a showing which would give the British knights of the mallet a surprise. If any of our large manufacturers of sheet metal and iron goods have agencies in England we hope they will push for the admission of their goods, just to show our British cousins that we did not do any better than we knew in getting up samples of our handicraft for the Centennial.

**Phosphor Bronze Wire Ropes.**—M. J. Manne, the manager of the Phosphor Bronze Works, at Val-Benoit, Liege, has made pit

### ANSONIA CORRUGATED STOVE PLATFORM

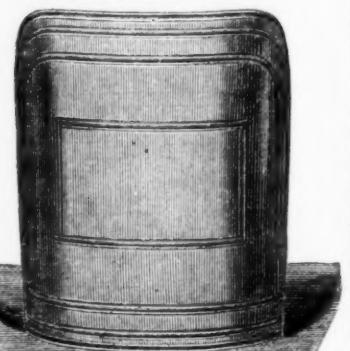
Manufactured by the

Ansonia Brass & Copper Co.  
Office, 19 & 21 Cliff Street,  
NEW YORK.



The Ansonia Corrugated Stove Platform, with its heavy flared edge border, is believed to be the best Platform offered to the trade. As shown in the illustration, the new invention requires no lining to keep it in place or to prevent it from turning up at the edge, while the metal is of sufficient thickness to require no lining.

The low price, superior quality and fine finish of this Platform will be readily acknowledged. Packed 24 in a case.  
Send for price list.



**ANSONIA**  
Bronzed Fire Screen,  
With Ornamented Moldings.  
PATENT APPLIED FOR.

**The Portable Bronzed Fire Screen or Shield**, as shown in the illustration, is especially designed for the safety and protection of walls, furniture, woodwork, paper or varnish from heat. Being constructed of metal, with firm and substantial edges, curved in form to stand alone, it may be easily adjusted to any position required, before a grate, fire, &c. The demand for something useful, durable and ornamental as a Fire Screen has long been felt, and having finally accomplished the desired result, we are prepared to fill all orders promptly.

**H. A. ROGERS,**  
BOX 4106.

19 John Street, NEW YORK.

### SUPPLIES, in every variety,

For Railroads, Mills and Manufacturers.

Send for new Illustrated Catalogue, 272 pages.

### G. W. Bradley's Edge Tools.

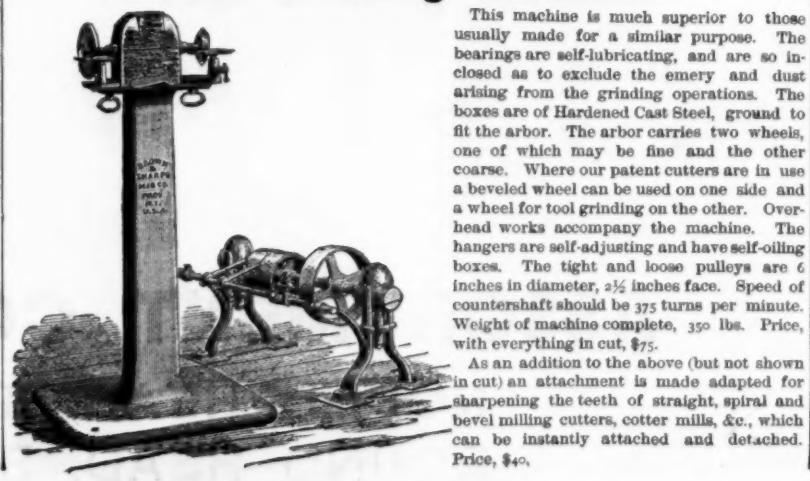
Ring Bush Hooks,  
Axe Eye Bush Hooks,  
Socket Bush Hooks,  
Watt's Ship Carpenters' Tools,  
Carpenters' Drawing Knives,  
Coopers' and Turpentine Tools,  
FOR SALE BY

MARTIN DOSCHER Agent, 96 Chambers Street, N. Y.

### BROWN & SHARPE MFG. CO.

Providence, R. I.

### Tool Grinding Machine.



This machine is much superior to those usually made for a similar purpose. The bearings are self-lubricating, and are so enclosed as to exclude the emery and dust arising from the grinding operations. The boxes are of Hardened Cast Steel, ground to fit the arbor. The arbor carries two wheels, one of which may be fine and the other coarse. Where our patent cutters are in use a beveled wheel can be used on one side and a wheel for tool grinding on the other. Overhead works accompany the machine. The hangers are self-adjusting and have self-oiling boxes. The tight and loose pulleys are 6 inches in diameter, 2 1/2 inches face. Speed of countershaft should be 375 turns per minute. Weight of machine complete, 350 lbs. Price, with everything in cut, \$75.

As an addition to the above (but not shown in cut) an attachment is made adapted for sharpening the teeth of straight, spiral and bevel milling cutters, cutter mills, &c., which can be instantly attached and detached. Price, \$40.

from the monster Corliss engine, which drives a world of machinery, to the monster Krupp cannon, which hurls its massive missiles over vast distances with unerring precision, to the keen blade of Damascus and the hair springs of our delicate watches; from the huge columns that tower in great capitals, at home and abroad, to the most exquisite female trinket; from the stupendous iron-clads that trample down the tempestuous sea, to the fragile instrument of the fearless surgeon; from the iron locomotive on its rails of steel, to the gossamer fabric almost as light as the air itself; from the massive temple to the trifling toy.

This single mineral, iron, enters into nearly all our wants and luxuries. It helped Franklin to tame the lightning of the skies, and wards that lightning from our homes; it aids the transmission of human thoughts over seas and mountains, to the utmost ends of the earth, almost "as swiftly as the sightless couriers of the air," and it assists the distribution of these thoughts by converting the printing press into an almost conscious being.

The artist, painter, sculptor, architect, physician, astronomer, soldier, sailor and scholar, the builder and the antiquarian, the man of peace and the man of war, the lady in her boudoir, the matron in her kitchen, the poor girl with her hired sewing machine, the poor boy in his fight for a trade, the editor with his steel pen, the printer before his iron case, the engineer as he traces and tracks the wilderness—in most things, practical and poetic, present and future, the things of to-day and to-morrow, this simple gift of God comes as a precious benefaction, making many of His other gifts more useful and rare.

If you will go to the well known home of the same Mr. Harrison to whom I have alluded, you will see how he has illustrated his own thought, and how he has crowned the great guild of human labor. It is a picture called "The Iron Worker and King Solomon," painted for Mr. Harrison in 1865 by the celebrated Christian Schussele. The object is to show that iron is the chief agent in all the mechanic arts.

The orator then gave a graphic description of the picture, winding up with the words of Solomon the King: "Stay where thou art, and let those who would spurn thee from thy place feel with me the just rebuke thou hast bestowed upon us."

**The Liability of Indorsers.**—The United States Supreme Court, in a recent decision, lays down several principles of law in reference to the liability of indorsers on promissory notes. It holds that an indorser is a competent witness to prove an agreement in writing, made with the holder of the note at the time of the indorsement, that he shall not be held liable thereon, where the paper is still held by the party to whom the indorsement was made and has not been put into circulation. It also holds that an agreement like this and the indorsement taken together are equivalent, so far as the holder of the note is concerned, to "an indorsement without recourse to the indorser." It further holds that the omission of indorsers on a series of notes, under such agreement, to set up the agreement as a defense in suit brought on two such notes, does not preclude their setting it up in another action brought on other notes of the same series, the judgment in the first action not operating as an estoppel in the second.

# RUSSELL & ERWIN MANUFACTURING COMPANY

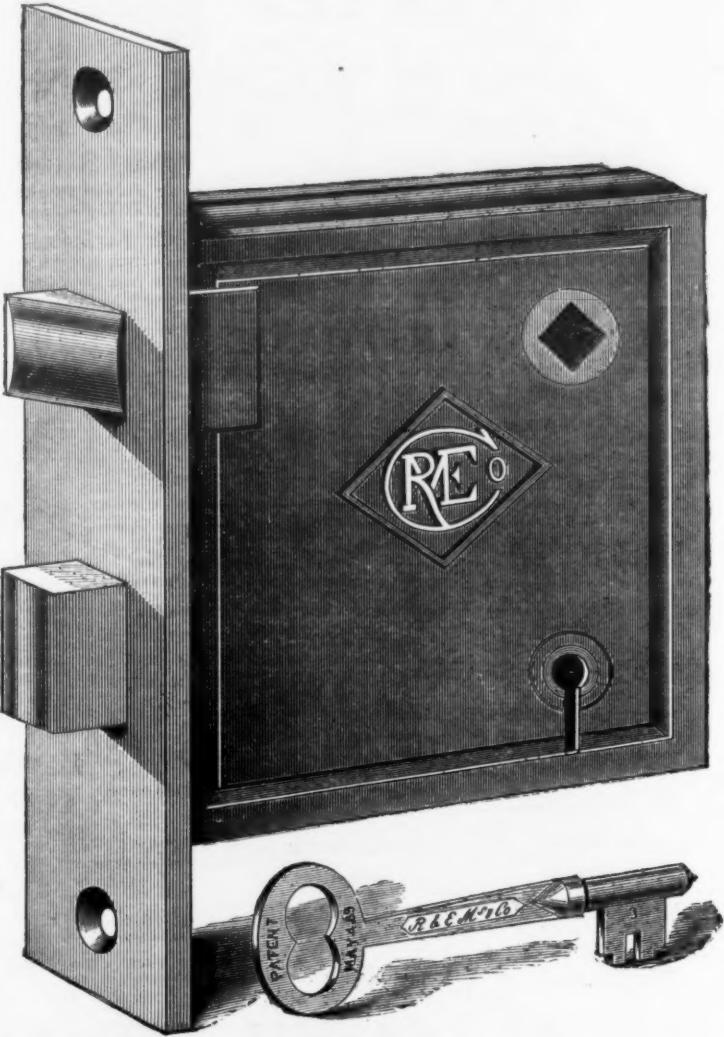
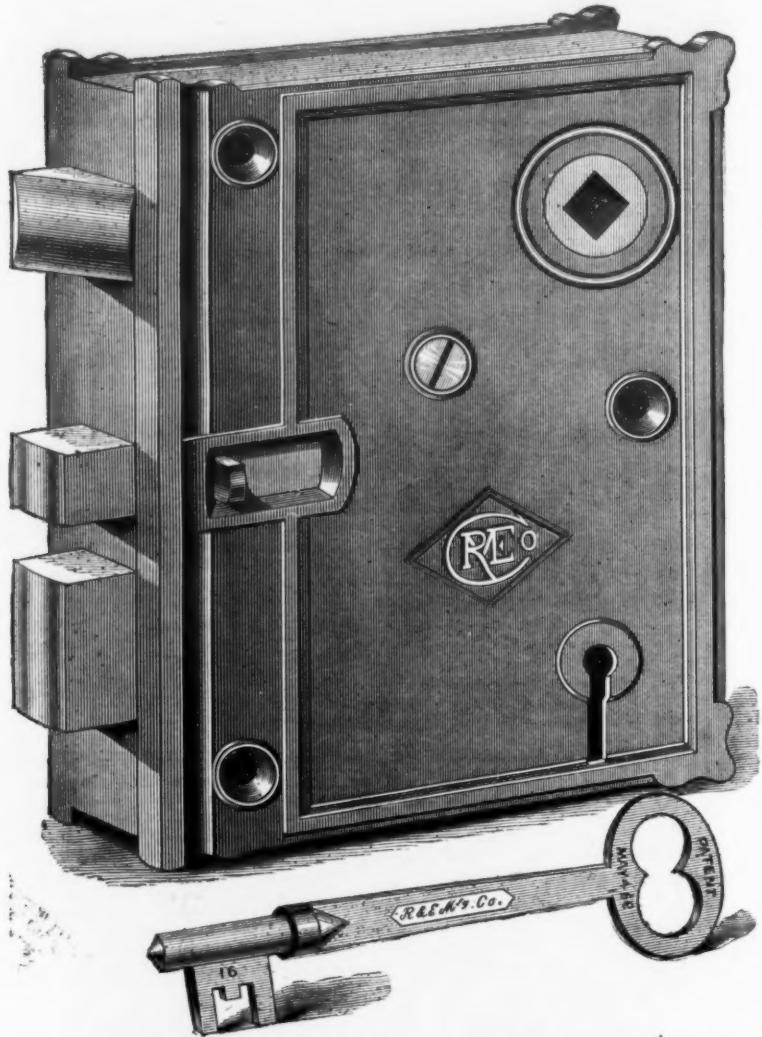
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PHILADELPHIA, No. 425 Market Street.

SOUTHERN DEPARTMENT,  
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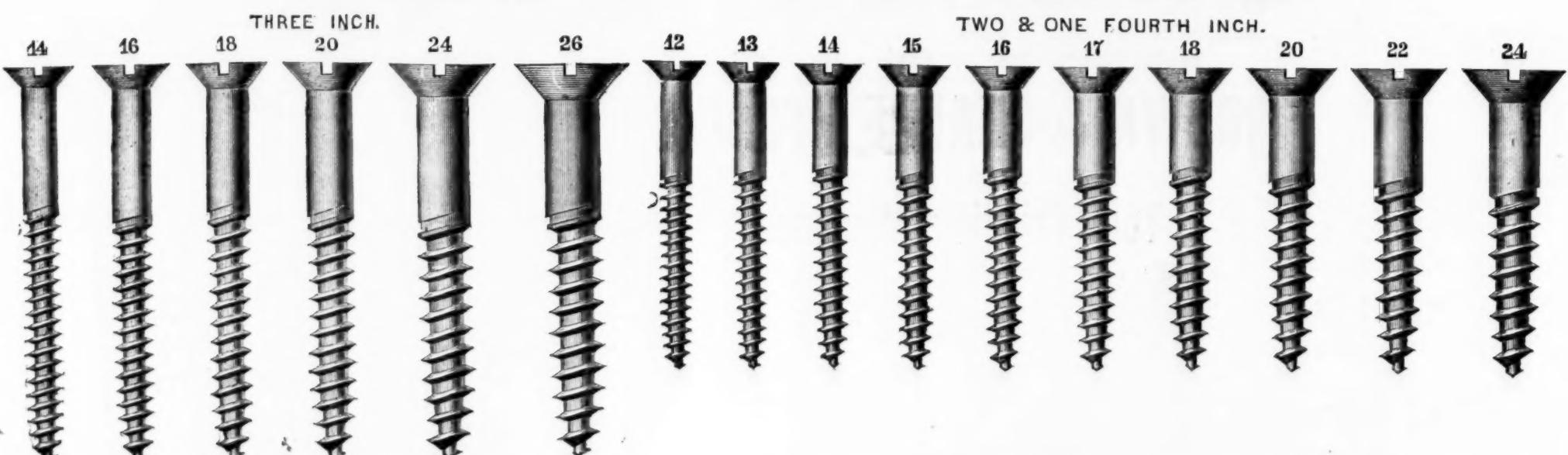
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FLAT HEAD, BRASS.

**ASSORTMENT COMPLETE.**

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ROUND HEAD, BRASS.

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THE MILLER BROS. CUTLERY CO., West Meriden, Conn.



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Electro Plated Ware, German Silver and Britannia Spoons.



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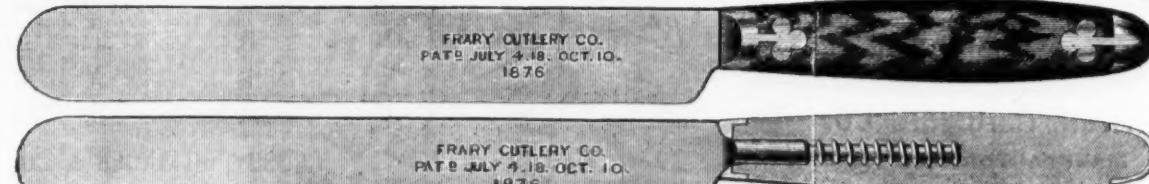
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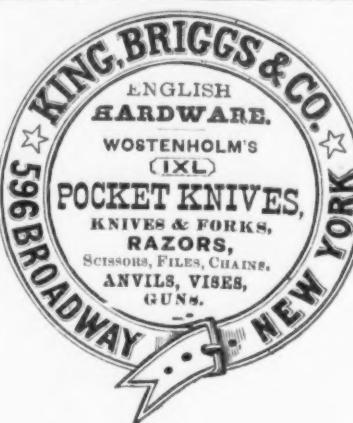
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PAT. MAY. 26. 72.

These Scissors are made of the very best steel, nickel plated, and so constructed that they can be readily folded and carried in the pocket without injury to the garments. A sample pair will be sent by mail, to the *Trade*, upon receipt of the retail price, namely: For small, one-half pointed.....\$1.00 Large size, pointed or half pointed.....\$1.50 New York, Feb. 1st, 1876.

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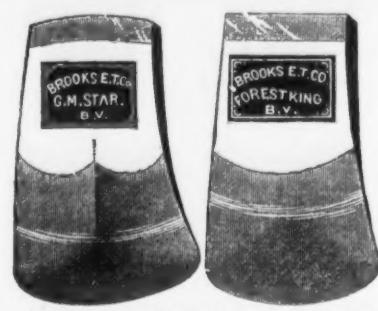


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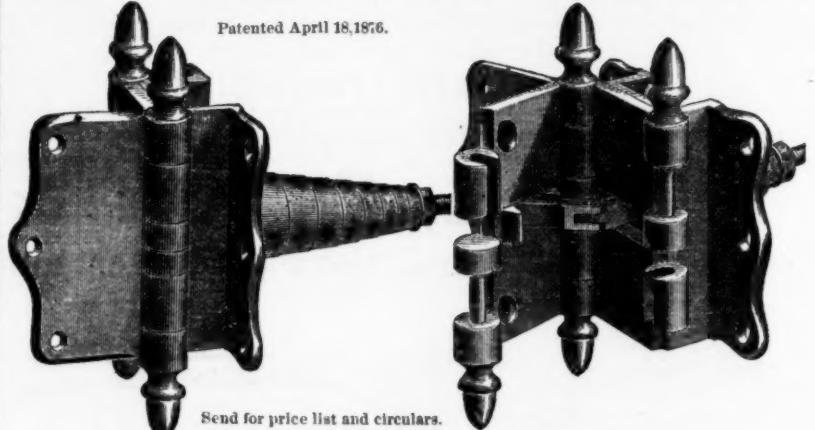
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in use, and which, when using, conveys no uncom-  
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Sad Iron in the market. Send for Price Current.

CHALFANT MFG. CO., 415 Commerce St., Philadelphia,



# The Iron Age.

New York, Thursday, July 12, 1877.

DAVID WILLIAMS . . . . . *Publisher and Proprietor*  
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The publishers of *The Ironmonger*, 44a Cannon Street London, England, will receive orders for subscriptions and advertisements on our regular terms.

AUSTRALIAN AGENCY.  
The American Hardware Company are our agents for Australia. They will exhibit files of *The Iron Age* in the American Building of the International Exhibition, at Sydney, N. S. W., where subscriptions will be received. After the close of the exhibition, the files may be obtained by letters for sale, addressed to their office in Melbourne. Sample copies will be mailed by them, free of charge, to any firm engaged in the trades we represent in Australia, Tasmania and New Zealand.

City subscribers will confer a favor upon the publishers by reporting at this office any delinquency on the part of carriers in delivering *The Iron Age*, or in any paper on which the carriers are responsible. Our carriers are instructed to deliver papers only to persons authorized to receive them, and not to throw them in half-ways upon stairs; and it is our desire and intention to enforce this rule in every instance.

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### The Condition of the Iron Trade.

The present condition of the iron trade is certainly as disheartening as it has ever been, with but few, if any, sources of encouragement. A score of times during the past ten years, when prices have been forced down, notwithstanding the most strenuous efforts to prevent it, ironmasters have said, "Surely bottom is reached now;" but there has always a lower depth been found, until now iron and nails are selling lower than ever before in the history of the trade, and at prices, in some cases, that no one is wild enough to claim they can make them at; or, if they do claim it, they are not silly enough to expect anyone to believe them. There seems but three courses left to the individual ironmaster: one to stop his mill; the second to continue to sell at a loss, making good iron; and the third to make an inferior grade of iron and sell it at the low price. The first requires an unusual degree of moral courage. Every mill owner who reads these lines knows how cheerless, how disheartening a sight an idle mill is, and there are but few sacrifices he will not make to keep the mill running, in part at least. The second is no pleasanter, but a strong firm can afford to lose money for a long time and still preserve their credit. A few dollars a ton loss requires a number of months to count up in the thousands, even if a mill runs full, and when it runs only in part, \$20,000 will go a long way. This is the secret of the wonderful persistency of certain mills and certain sections in face of the well known fact that they lose money on every ton of iron sold. It requires a longer time to exhaust money and credit than we are apt to suppose. Mills run on in the vain hope that something will happen to make business suddenly better, and if it does they will be in a position to take advantage of it. It is a fact that large amounts are often made by just this readiness to take advantage of the market. Should a sudden demand arise the wisdom of the policy of continuing in operation will be vindicated, but there is but little hope of any such reaction.

The alternative of making bad iron to sell for a price that is as "bad" as the iron sold, is one to which no mill with an established trade can afford to have recourse. It

will give any mill that undertakes it a reputation for poor iron that they cannot correct for years, and will cause the iron to be shunned by consumers. Some of this iron will get into structures on the safety of which life and limb will depend, and when they give way and a horror follows, the mill making the iron will get a free advertisement that will not tend to bring many orders to it.

But though working as individuals the ironmasters of the country seem shut up to these disagreeable alternatives collectively. If they will be honest and truthful, each with the other, there is one way out of this trouble, and that is by reducing production by concerted action. There is no use in disguising the fact or assuming to ignore it. There is no salvation to the iron trade until the mills agree to reduce production, and with this there is. The mills that are running the strongest and making the best show at the present prices, will in many cases be the ones that will be in the most pieces when the crash comes. But a large reduction of output would at once advance the price of iron and enable some profit to be made on that which is sold. Is it not the part of sensible men to adopt this course?

Geometrical Chemistry.

The faculty of the Stevens Institute of Technology have paid a graceful tribute to American progress in science, by conferring the honorary degree of Doctor of Philosophy upon Prof. Henry Wurtz, A. M., for original research, and especially for the discoveries upon which he bases his remarkable theory of Geometrical Chemistry. As this is the first time the faculty have used the power to confer honorary degrees, except to confer that of M. E. upon graduates, and as the faculty which includes such eminent scientists as Morton, Thurston, Mayer, Leeds and Wood were unanimous in the opinion that Prof. Wurtz's discoveries were of sufficient value to merit the highest honor in their gift, the compliment is one of which any man of science might be proud. Prof. Wurtz's theory of geometrical chemistry was, we believe, first outlined in these columns, and we then took occasion to predict for it the recognition since accorded it. Chemists and mathematicians, always conservative in matters of theory, received the new system in silence, and their later approval, given after mature consideration, is the best evidence that a careful examination has revealed it in a substantial basis of truth.

The theory of Geometrical Chemistry is somewhat too complex, and embraces too wide a range to be described briefly. Aside from the theory, however, Prof. Wurtz has discovered a great number of facts in relation to the mathematical relations of molecular volumes—facts which had previously been entirely unsuspected as well as unknown. The first point sought by Prof. Wurtz was a standard temperature in Nature. This he very conclusively demonstrated to be the temperature of ice at the point of incipient fusion. This found, the first fact discovered was that the volumes of all single chemical molecules, with one exception, are expressed by quantities which have the relations of even cubes of whole numbers. The one exception

is oxygen, the molecular volume of which, deduced from a comparison of water with peroxide of hydrogen, is 5184, or three times the cube of 12. Calculations made upon an immense number of density determinations, fail to show that oxygen ever changes this volume—or diameter, as it is perhaps more appropriately called. Another discovery is the fact that hydrogen is the most variable of all the elements. It is found that molecules which combine to form a new substance, tend to assume very nearly the same size. Again, the tendency to vary increases with the electropositive nature of the element. Later researches develop the fact that, in many different series of compounds, the diameters of some one element or elements vary in different members of the series by four units. The significance and importance of these facts alone are enough to render Professor Wurtz's labors worthy of high honors. What was at first regarded by some as singular coincidences in numbers, is now seen to be beyond the possibility of mathematical doubt. The facts discovered seem to give us a key to the philosophy of chemistry. Already some classes of substances, which have long defied the efforts of chemists to classify them rationally, fall into natural relationships depending upon the diameters—cube roots—of certain elements. We have personally gone over some thousands of figures relating to this subject, and have been surprised to find that the larger the number of volumetric determinations used for comparison, and the greater the accuracy of the experiments, the more closely did the theoretical and experimental figures agree. In complex as well as simple compounds there is the same close correspondence. The new field thus opened for investigation and research is most promising and interesting, and the results already obtained are of the highest value in establishing the relationships among a great many classes of substances in regard to which chemists have never been agreed.

### Does our Government Need to Send Abroad for Armor Plates?

The following item, which appeared in the Philadelphia *Press*, is obtaining some currency:

A board of naval constructors and engineers, Rear Admiral Mullany, president, appointed to consider the advisability of completing the iron-clad at Roach's shipyard, has recently been in session at Chester. It is expected that it will recommend to the Navy Department the speedy completion of the monitors at the yard in all the details, and will also recommend the erection of a suitable mill for the fabrication of heavy armor plates of from ten to eighteen tons each, we at present being entirely dependent upon the English manufacturers for this class of material. A mill to furnish plate iron for armored vessels is required, but the necessary outlay of capital would hardly be justified unless encouraged by the general government. In the event of receiving this encouragement, Mr. Roach proposes to erect a large mill at his yard, at Chester, or enlarge the rolling mill at South Chester.

This calls for partial contradiction at least. It is a fact well known to the iron trade and the Navy Department, that in 1864 Messrs. Moorhead & Co built just such a mill as the one now proposed, and that armor plates were rolled on it 3 to 12 inches thick, up to 5 feet wide and 12½ to 20 feet long, and this did not test the capacity of the mill. The mill is still standing, and with a few weeks notice could be prepared to furnish anything in the line of armor plates that can be made in England or elsewhere.

If ever a series of murders was committed without a shadow of excuse, or even palliation, it was that that ended in the execution of eleven of the so-called Molly Maguires on the 21st ult. The details of the causes of these murders, the brutal animal revenge for slight personal injury that was the producing cause, the deliberation with which they were planned, the horrible mockery of justice with which the different divisions of the order, on *ex parte* testimony, decided that the grievances of the Mollies were sufficient to require the death of the accused, and the allotting of the murderers by other divisions of the order, as an act of friendship to be repaid on demand—all put these murders out of the catalogue of ordinary crime and place them among the *causes célèbres* of criminal annals. One who has read these details even cursorily would scarcely believe it possible that an apologist could be found for these crimes and an indirect, if not direct, justification of them. But such is the fact. To show this, read the following extracts from an article in a journal published in the interest of labor:

"The coal companies have driven the miners mad. Eleven were caught and hurled into eternity to satisfy the rapacious demands of justice." Are the demands of justice "rapacious" when they ask that such crimes as those for which these men were executed meet their just punishment? Is "rapacious" a good adjective in this place?

Again the same journal says: "The outrages perpetrated by the miners bear scarcely any proportion to the wrongs perpetrated on them." Does this mean that the murder of policeman Yost bears scarcely any proportion to his arrest of Thomas Duffy?—that is, that the "outrage" of the murderer by the miner was less than the wrong perpetrated on the miner by his arrest for drunkenness and disturbance of the peace? But a question comes in here: What were the wrongs perpetrated on the men who murdered Yost? These men had never seen him, and he had to be identified to them in order that they might commit the murder. If the whole list of murders were gone through with, it would be found that the wrongs perpetrated on the miners, that were the producing cause of these murders, were similar to the above.

We do not wish to charge these crimes on the individuals composing labor unions, but we do not hesitate to say that they are the legitimate and logical result of the claims and asserted rights of these unions. They not only claim the right to say for what wages men may work, but they also claim that no one else shall work for any less wages, and should anyone, no matter what his necessities, work at a rate less than that fixed, he is branded as an outcast, and is practically regarded as an excommunicated heretic in the middle ages. There is a further so-called right which they claim that is still more destructive of all true right and justice, and that is, if a man fits himself to occupy a certain position he has a right to that position. That we not be accused of misrepresentation, we quote from a labor organ: "A man when he fits himself to perform certain work has a certain right to it." If this is a correct proposition, then, he has a "right" to prevent anyone from taking it away from him or preventing him from working at it, and there is but a step from this to the right to

murder a mining boss for discharging him. Among the class of men who largely make up the miners, an assertion like that we have quoted, once accepted, would naturally lead to the justification of murder in the event of a discharge from work; and this seems to have been just the view that was taken by the divisions. Saenger, the mining boss, discharged a miner. The miner complained to the division, and it was decided that Saenger must die, for he had deprived the miner of his rights. There seems to us no question but that such outrages as these are the legitimate results of trade unionism as it is conducted in this country.

and depend on charity to keep one's self from starving than to work for an employer who requires one to mind his own business and is arbitrary in the enforcement of general rules. Of course, those who now voluntarily abandon work only make room for others who are willing to conform to rules, and who do not put themselves in a position to be snubbed by their employers. Probably those who come in are better men than those who go out, and are glad to get the chance to earn their living; but the strikers invite our admiration as they stand on their dignity, with idle hands in empty pockets. Perhaps during the coming winter, when they hold out these same idle hands with an appeal for undeserved charity, they will realize that they have acted like fools, and brought upon themselves and their families misfortunes which are greater than they can bear unaided.

Few things are more pitiable than to see our workingmen, strong handed and kind hearted, drugged with the poison of false teachings and led to their ruin by the self-seeking demagogues who fatten upon their miseries. Oh, for a Moses, great of heart and strong of arm, to lead this army of honest, well-meaning workingmen out of the worse than Egyptian bondage into which they have fallen, and expound to their simple understandings the immutable laws which govern all exchanges, whether of commodities or of services. No nation ever lived under a tyranny so absolute as that which labor exercises over itself, and no tyranny ever pursued its victim into his home and social life with a persistence so unrelenting as that with which a union pursues the individuals who compose it. Who shall lead the masses of labor in successful rebellion against this dark oppression, and secure for the workingman the right to earn his daily bread as and when he can, and to eat it in peace?

### Reports of the United States Commissioners to the International Exhibition at Vienna, 1873.

It has not been forgotten that, by authority of Congress, the President appointed a commission of scientific men, and also a commission of "artisans," to visit the International Exhibition held at Vienna in the year 1873. These commissions were instructed to report to the President on their return, giving an account of such matters as they should consider worthy of publication by the government. These reports were, in some cases, not presented by the authors until three years had elapsed from the close of the exhibition. The whole collection was finally placed in the hands of an editor by Mr. Fish, then Secretary of State, in whose charge the matter had been placed by the President, and, a few months later, they were published at the government printing office and distributed to members of Congress, from whom they are to be obtained by a favored few among their constituents. Those who cannot expect favors of this kind from their representatives, may, if they are fortunate, either secure them from the Department of State, from which sets are distributed to libraries to prominent individuals who are known to be capable of making good use of them, or by purchase in the shops of booksellers having facilities for obtaining them from congressmen who are more interested in the politics of their districts than in their enlightenment.

We have already briefly noticed the issue of this important work, and now will endeavor to fulfill our promise to give a somewhat full abstract of those reports which are likely to have interest for our readers.

This great mass of material, which now fills four large volumes and covers about 3500 pages of the large octavo size adopted for public documents, was entrusted to Prof. R. H. Thurston as editor. He has classified the reports under several heads, as agriculture, science and education, engineering and architecture, and metallurgy. The first volume, which contains the reports on agriculture, also contains a collection of exceedingly interesting and valuable translations of the reports of foreign commissioners to the exhibition, in which the American exhibitor is permitted to see himself as others see him, and from which some profitable lessons may be learned. As remarked by the editor:

"It is a subject of congratulation, and will be a source of real pleasure, to every citizen of the United States, that these criticisms are so generally favorable. They are even, in fact, more favorable than they at first glance might appear. In reading them, it is to be remembered that the foreign writer—born and bred in distant countries, under influences with which the citizen of the United States is unfamiliar, and from which he is, fortunately, free, accustomed to habits of thought, and familiar with methods which are equally strange to those who see the work he criticizes, viewing the subject of his criticism from an entirely different standpoint, and through a medium of a very different hue—must necessarily be placed at some disadvantage. He cannot be expected to see the real value of American methods or of American productions, taken apart from the peculiar circumstances which have brought them into existence. The real bearing of the distinctions arising between the older nations of the Eastern Continent, which are slowly progressive, stationary, or even retrograde in their changes—in which the conservatism and tradition have



## INDUSTRIAL ITEMS.

## VERMONT.

The Pittsford Furnace, at Pittsford, went into blast about four weeks ago, and is making about ten tons of very superior car wheel iron per day. They are using their own hematite ores mixed with the "New Bed" Bessemer ore, of Moriah, N. Y. This furnace also makes very handsome spiegeleisen. Next week they go on to the "Chateaugay" ore entire, on a contract with a large iron and steel house in Boston. This ore has never been smelted before, but the blooms and billets are well known in Pittsburgh, Cleveland and other markets as being the very best for fine steel purposes.

## CONNECTICUT.

Barnum, Richardson & Co.'s No. 3 Furnace, at Canaan, has run 108 consecutive weeks, making 9055 gross tons of iron, or an average of nearly 84 tons per week, and is still in blast. This is the best blast known to have been made in a charcoal furnace.

At a recent meeting of the Hunt Lyman Iron Company, of Huntsville, it was decided to again start their furnace in that village at a not far distant period, probably in the early fall.

Mr. Peet has begun in good earnest the transportation of ore from his Tobey Hill ore bed to the furnace of the Barnum, Richardson Company, in East Canaan, large quantities being hauled daily.

The Pratt & Whitney Company, at Hartford, shipped eleven Gardner machine guns to China last week.

An order for twelve Gatling guns has been received at Colt's, in Hartford.

The Wallingford Community are soon to begin the manufacture of spoons, under the superintendence of H. W. Bassett.

The Hull & Belden Co., Danbury, are working all hands steadily twelve hours per day, from 6 a. m. to 7 p. m., with an hour at noon, on contract light machine work, special machines and drop forgings.

## NEW YORK.

The new charcoal furnace at Clove Spring is being converted into an anthracite furnace.

## PENNSYLVANIA.

The Clara (Croyther) Furnace, at Newcas-  
tle, goes in blast this week.

One of the Etna furnaces, at Newcastle, goes out of blast this week for repairs.

The Wampum Furnace has blown out to put up a new stack.

The rolling mill of Seyfert, McManus & Co., Reading, has stopped until the 15th inst., during which period of cessation important repairs will be made.

In the Shenandoah district there are 27 col-  
leries idle and 28 working.

The Warwick Iron Company, of Pott-  
town, are adding two new boilers at their  
mines near Boyertown, and have contracted  
for one of Knowles' steam pumps, one of the  
first of the kind that has been erected in  
Pennsylvania.

Lebanon Furnace stack No. 3 was blown  
out week before last for repairs.

The roof is being put on the machine shop  
that is being rebuilt at Scott Foundry, Read-  
ing. The walls of the building have been  
made higher than they were previous to the  
fire.

The Allentown Iron Works have just put  
two more stacks into blast.

The Reading Railroad Company brought  
down for the week ending the 30th ult., 148,-  
265.14 tons of coal; for the season, 3,614,-  
893.14 tons; increase over corresponding  
period in 1876, 1,010,031.01 tons. The ton-  
nage of the Schuylkill Canal for the same  
week was 10,531.10 tons; for the season,  
313,811.10 tons; increase, 70,949.15 tons.

A new stationary engine has been built for  
the tube works of Seyfert, McManus &  
Co., Reading, which was to have been put up  
in month. However, recently large orders  
for flues and other kinds of pipe have come  
in so rapidly that it is thought the mill can-  
not be stopped long enough to make the pro-  
posed improvements and repairs.

The Fannie Furnace, Middlesex, was to  
have blown in Monday or Tuesday of this  
week.

The Westerman Iron Co. made and sold  
more finished iron during the last year than  
they have in any other year since their orga-  
nization. They have also sold a great  
amount of pig iron (which is something new),  
and have a good amount in the yard at pres-  
ent.

Allen's Furnace, in Sharpsville, and the  
Shenango No. 1, in Middlesex, are both doing  
well.

The puddlers' helpers at Sharon gave no-  
tice that hereafter they must have Pitts-  
burgh rates, which are one-third of what the  
furnace makes and 5 per cent. of the re-  
mainder. Previous to this they were not re-  
ceiving the 5 per cent.; hence the strike.  
It is thought that the puddlers will double  
and work level handed. If they do this they  
can, with what "standing turn" men there  
are around the mill, keep all the furnaces  
running.

The Chester rolling mills are turning out  
large quantities of plate iron.

The Birdsboro Rolling Mill and Nail Works,  
which have been lying idle for repairs, re-  
sumed operations on Monday, the 9th. The  
capacity of the nail works will be increased  
by the addition of 12 more nail machines, the  
foundations for which are down.

C. M. Atkins, of Pottsville, has had an in-  
quiry, through a Philadelphia house, for  
30,000 tons of rails, to go to South America.  
The orders from the same party have hereto-  
fore always gone to England. Mr. Atkins  
named a price which was about cost, and yet  
\$2 per ton above the English prices. The  
offer has been forwarded. The party for  
whom the inquiry was made expressed a  
preference for American iron, but whether  
this will be sufficient to overcome the differ-  
ence of cost remains to be seen.

A number of car wheels intended for the  
Great Eastern Railway of England have been  
made at the Lehigh Car Wheel Works. The  
institution has also some orders from South  
America.

The Reading Fire Brick Works, of McHose  
& Co., are engaged at present in filling an  
order for furnace blocks to relin one of G.  
Lawson, Coleman's furnaces, at Lebanon.  
About 100,000 bricks will be required. The  
firm report orders coming in more freely for  
the past month, and expect to keep their  
works in steady operation.

AMERICAN SCREW CO.,  
Providence, R. I.

Manufacturers of

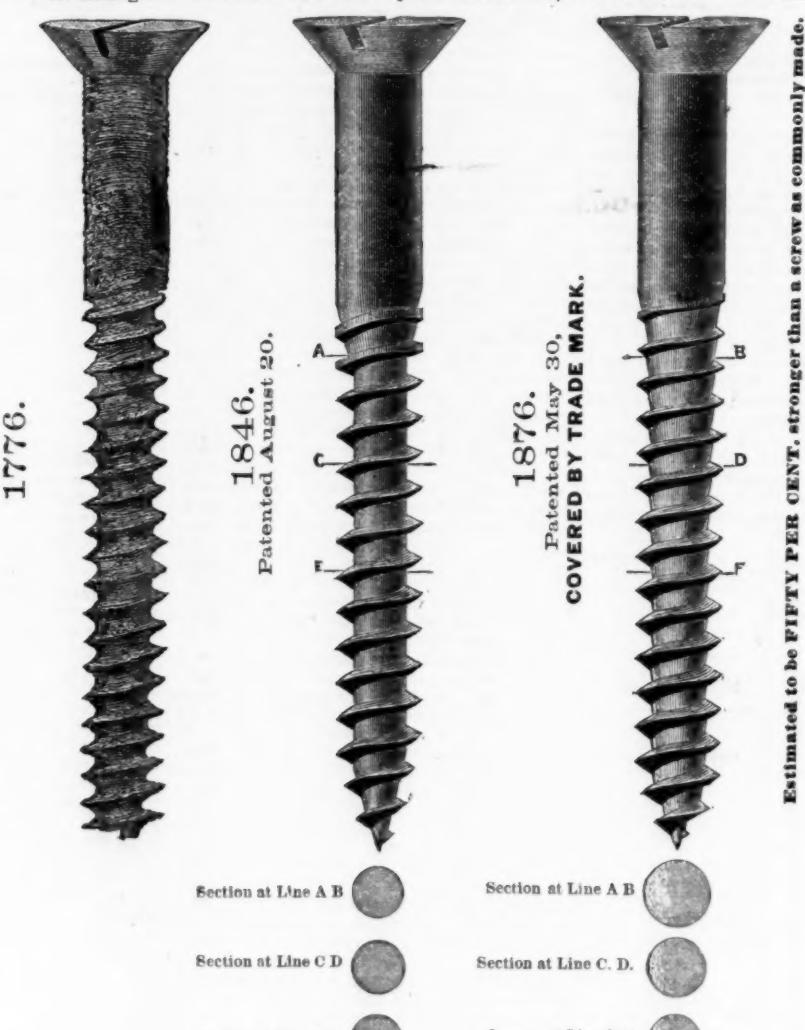
IMPROVED  
Gimlet Pointed Wood Screws,  
Patented  
May 30,  
1876.

After forty years' experience we offer to the trade our **Centennial Screw**, patented May 30, 1876, as the best we have ever known.

The method of manufacturing is also patented, and we are changing our machinery as fast as possible, to manufacture the **improved** article only. To introduce them, they will be sold at same price as the old style screw.

The new screws will be packed in manila colored **boxes** with new label covering end of box, and **enlarged figures** showing plainly contents.

To distinguish this screw we have adopted a trade mark, which is also secured to us.



The above drawings show the progress of screw making from the old **blunt point** style now adopted.

Experience has shown that the weak point of screws, as formerly made, is at the heel of the thread, where all the strains of forcing the screw into the wood naturally concentrate.

To avoid the sharp angle existing in the old style of screws has been the aim of all manufacturers, but every expedient hitherto adopted has proved as objectionable as the evil complained of.

It will be seen in our **new screw** that not only is the sharp angle avoided, but the strength very much increased, as illustrated above. See sections at lines.

## CLAIM.

"A Pointed Wood Screw having the outer periphery of the thread upon its body cylindrical, while a portion of the body below the thread and near the neck is conical, the remainder of the body to the point being cylindrical, and yet having all the thread brought to an edge of a constant angle, without jogs in the paths between the threads, substantially as described."

Stack No. 1 of the Saucon Iron Company, at Hellertown, was recently put in blast after lying idle since 1875. No. 2 will continue idle. We understand that the company have a contract for placing the iron as it is made, and as they have about 25,000 tons of ore on hand which is to be used up, work for at least a year and a half is assured.

The Allentown Iron Co. are filling up Nos. 1 and 2 furnaces preparatory to lighting them. This will make four out of six stacks in blast.

## PITTSBURGH AND VICINITY.

The coal and coke shipped by the Monongahela Slackwater Navigation Company during the month of June last aggregated 6,833,000 bushels, of which 5,804,600 were coal and 1,028,400 were coke. During the corresponding month last year the shipments of coal aggregated 1,273,900 bushels, and the coke, 453,900.

A saw 54 feet long and 8 inches wide, intended for use on the big trees in California, has just been turned out at the Beaver Falls Steel Works.

The Oliphant Furnace is out of blast, and will remain cold until the railroad to it is finished.

The twelve blast furnaces of Pittsburgh have a capacity of over 5000 tons per week. But five are in blast.

The new Lucy stack is nearly finished, and will be blown in next month.

A number of the rolling mills in the city are idle, making repairs and taking stock.

The mammoth iron dredge boat now being constructed on the Allegheny wharf for Captain Eads, will be launched on Saturday next. It is designed for special work in the South Pass, and is unique throughout. The entire cost of the boat will be about \$100,000. The total length is 181 feet, beam 32 feet, depth of hold 10 feet.

The Crescent Steel Works Company's em-  
ployees picniced at Hulton Station on Saturday,  
their employers defraying the expense of  
an extra train to and from the grove.

The repairs being made at the mill of W.  
D. Wood & Co., McKeesport, are quite ex-  
tensive.

## VIRGINIA.

Mount Torrey Furnace is running steadily  
and making a good red-short metal.

## OHIO.

We are informed, says the Hocking *Sen-  
tel*, that Messrs. Andrews Bros. & Hitch-  
cock, of Cleveland, have recently purchased  
extensive tracts of land in our mineral re-  
gion, and that they intend at an early day  
to erect one or more furnaces and a rolling  
mill on their premises. It is said they will  
use their production of pig iron in making  
bar iron, machinery of various kinds and all  
descriptions of finished work usually made  
in similar establishments elsewhere. This  
statement needs verification.

The third appraisal of the "Old Rolling  
Mill," and other property belonging to James  
Ward & Co., took place last Monday. The  
"Old Mill" appraised at \$12,000, the blast  
furnace at \$3600, and several lots in South  
Niles at from \$15 to \$50 per lot. The first  
appraisal of the mill was in the neighbor-  
hood of \$120,000, the second \$36,000, and  
now it is listed at \$12,000.

It is stated that the Belfont Furnace will  
go into blast in a short time.

All the iron mills at Ironton were idle last  
week.

According to the returns of the assessors  
the following are the productions of iron,  
coal, &c., in Lawrence County in 1876:

|                                   | Tons.     |
|-----------------------------------|-----------|
| Cold-blast charcoal pig iron..... | 5,154     |
| Hot-blast " "                     | 11,376    |
| Hot-blast stonecoal " "           | 1,104     |
| Stonecoal metal, foreign ore..... | 29,524    |
| Bar and nails rod iron.....       | 4,621     |
| Nails.....                        | 6,074     |
| Sheet and hoop iron.....          | 236       |
| Iron ore mined.....               | 60,504    |
| Persons engaged in mining.....    | 635       |
| Bushels stonecoal mined.....      | 2,258,393 |
| Persons engaged in mining.....    | 330       |

The works of Brown & Curtis, at Cleve-  
land, are running full, with constantly in-  
creasing orders for their wrought iron  
specialties. Within the past two weeks they  
have filled orders for about forty of their  
new patent shears for cutting wrought iron  
or steel. They are shipping about three of  
those machines per day, beside filling many  
other orders for agricultural implements and  
wagon irons.

## ILLINOIS.

The foundations of the spike machines at  
Joliet are down, and the machines are to be  
put in position at once.

The mill at Springfield is running on or-  
ders for rerolled rails in the rail department.  
The puddle mill is idle, and there are no im-  
mediate prospects for a start. The company  
are manufacturing fish plate, both plain and  
angle. They are also making preparations  
for the manufacture of nuts and bolts.  
They have put in one machine of each kind.  
They also propose to start a bar mill with a  
guide mill in the near future. The company  
also have a steel works under roof, which is  
not as yet finished, and no one knows when  
it will be. They propose to use the Siemens-  
Martin process.

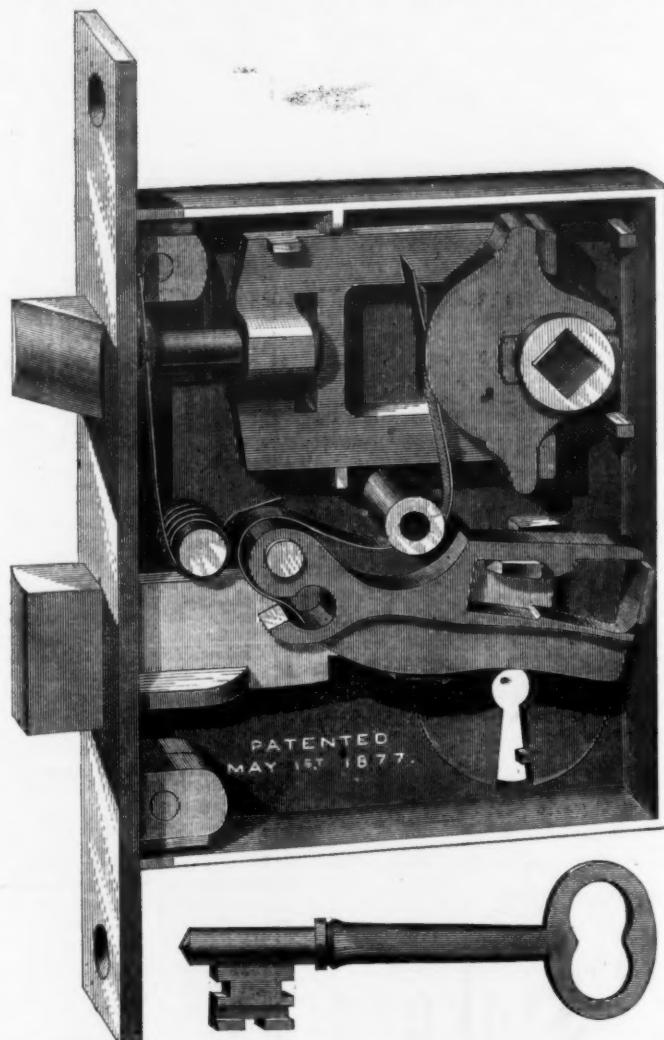
An exchange says: Dennis, Long & Co.,  
manufacturers of cast iron street mains,  
have recently bought the whole product  
from Oxmoor Furnace, Birmingham, Ala.,  
amounting to 5000 tons. They have their  
hands full of contracts, and are running full  
force, employing 280 men, and melting 90  
tons per day. They have orders on their  
books now for San Antonio, Texas, three or  
four cities in Michigan, and several in each  
of the states of Iowa, Missouri, Illinois, Indiana,  
and Ohio. The year's contract with  
Cincinnati and Chicago has also been given  
them. The latter contract was awarded last  
week, the bids having been opened and read  
publicly. There were bidders from Pitts-  
burgh, Philadelphia, New York, Buffalo, St.  
Louis, Milwaukee, Cleveland and Columbus.  
Dennis, Long & Co. were 18 cents per ton  
lower than the lowest (Philadelphia), the  
other Western bidders having bid most  
random shots.

The Louisville Rolling Mill Company, T.  
C. Coleman, president, have suspended. A  
meeting of the creditors was called for July  
5th, the result of which we have not heard.  
[Continued on page 18.]

**P. & F. CORBIN,  
MANUFACTURERS OF  
BUILDERS' AND MISCELLANEOUS HARDWARE.**

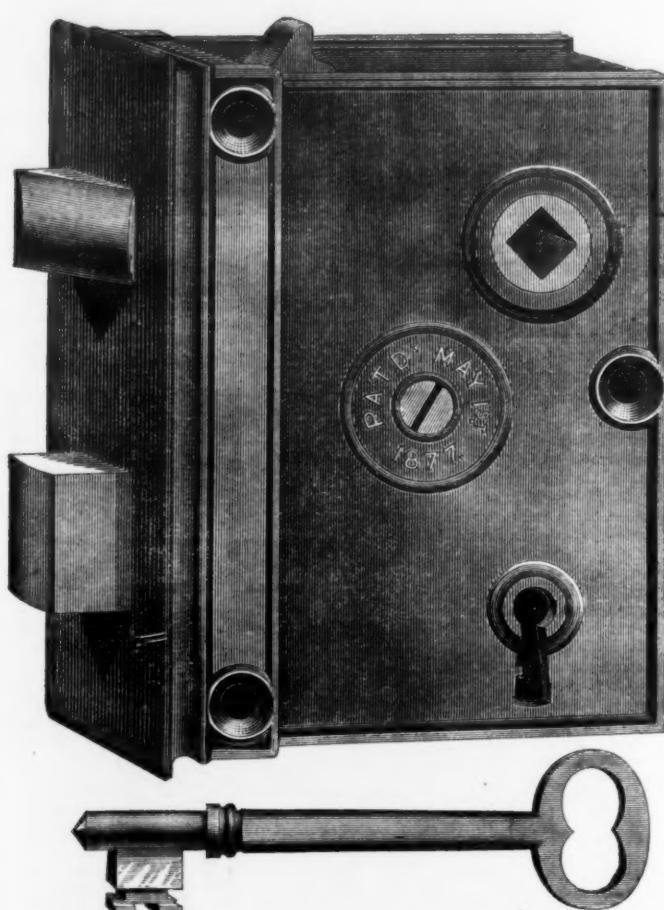
Factories. NEW BRITAIN, CONN., U. S. A.

**Warehouse, NEW YORK, Nos. 87 CHAMBERS and 69 READE STREETS.**



### Patent Reversible Mortise Knob Lock.

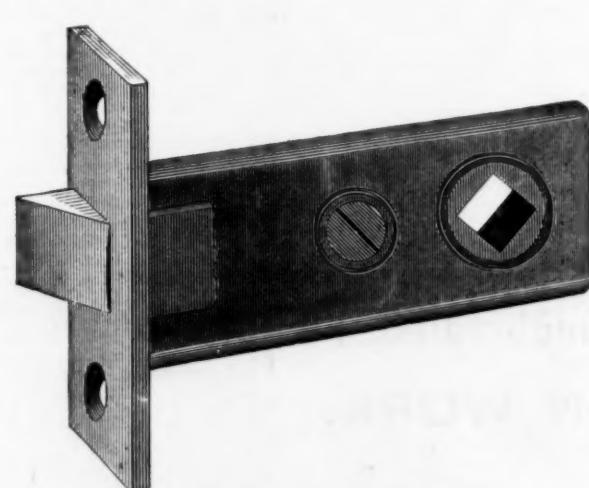
3½x3½ Inch, Nos. 1179 to 1185.



## **Patent Reversible Rim Knob Lock.**

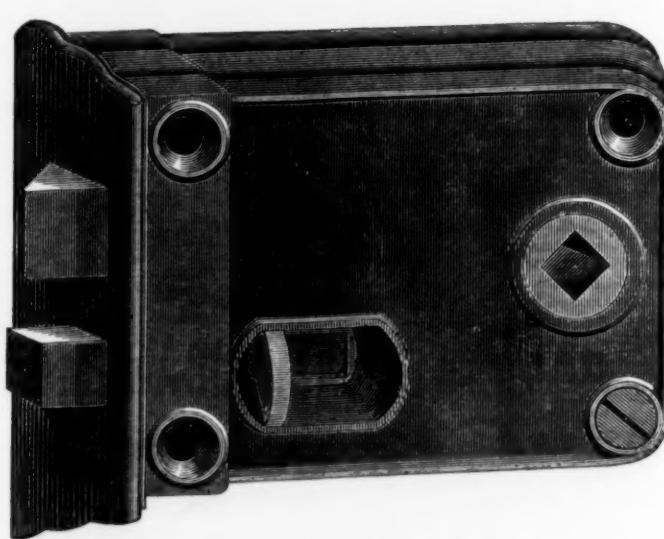
4x3 Inch, Nos. 462 and 463, with Stop.

To change the hand, simply draw the Latch Bolt forward and turn it half round. The Hub TAKES its BEARING in BOTH PLATES, making the Lock as STRONG and SUBSTANTIAL every way as the old style handed Lock. We have introduced this style Reverse in 3 1-2 and 4 inch Mortise and 4 and 4 1-2 inch Rim.



### **Mortise Knob Latch.**

No. 0



### Rim Knob Latch.

No. 302

## LOCKS WITH BRASS PLATED FRONTS AND BOLTS.

When ordering Locks with Brass Plated Bolts, give the regular number, and add the letter b, thus: No. 0 b or No. 1170 b. When ordering same with Brass Plated Fronts and Bolts, repeat the letter, thus: No. 0 bb or No. 1170 bb. No other description needed.

[Continued from page 16.]  
INDUSTRIAL ITEMS.

The Louisville Chain Works, Messrs. Byrne & MacKenzie, will be ready for business within two weeks. They will run twenty-two fires and employ seventy hands. Their line of goods will include the manufacture of patent wrought iron swivels, trace, coil, ox, log, wagon, drill, reel, lift, rake and steamboat chains—all sizes, indeed, from a trace chain up to one inch. Capacity 700 to 800 pairs of trace chains per day, with proportional amount of coil and twist.

Fischer, Leaf & Co., stove and mantle founders, Louisville, are running full force, and have all the business they can do.

TENNESSEE.

The Chattanooga Furnace is out of blast for repairs.

Bear Spring, Clark and La Grange furnaces are in blast and selling their iron very nearly as fast as made.

The Cumberland Furnace is in blast and increasing its stock slightly.

Brownsville Furnace is cutting wood and getting ready for a small blast.

Dover Furnace is idle and for sale, with some prospect that it will be purchased by Pittsburgh parties and put in blast soon.

Rough and Ready Furnace is not likely to start till long after business revives. The same may be said of Wayne.

It is reported that Mr. A. B. Payne, of Nashville, is preparing to start Worley Furnace.

Mount Vernon Furnace will remain idle until there is something tangible in the revival of trade.

The Roane Iron Company's Rail Mill, Chattanooga, commenced rerolling old rails for the Memphis and Charleston and the East Tennessee, Virginia and Georgia railroads the other day, to complete which will require, it is stated, three or four months.

The convicts of Tennessee have been leased to the Sewanee coal mines for six years, for \$70,500 per annum.

ALABAMA.

From a yield of 4000 tons in 1873, the product of Alabama's coal mines grew to 65,000 tons in 1876.

KENTUCKY.

We clip the following notes from the Greenup *Independent*: "The sale of Boone Furnace property was confirmed on the 12th ult. by the United States District Court. The purchasers are D. M. Davis, of Pomeroy, O., and Jacob Ricker, of Cincinnati. In the Kentucky portion of the Hanging Rock iron region there are but five charcoal blast furnaces in operation this year, viz.: Bellefonte, Mt. Savage, Charlotte, Pennsylvania and Hunnewell, Pennsylvania Furnace is doing well. They are making 12 tons of iron daily. The furnace is well supplied with good ore. Charcoal is being received at the rate of from 12 to 14 loads per day. The Princess Furnace made a fresh start on the 15th of June. Twenty-five miners are employed to supply the furnace with coal. Ore is being received at the rate of 60 tons per day. Bellefonte Furnace, Boyd county, is making 12 tons. No. 1 charcoal iron every 24 hours. This furnace went into blast the 3d of last May, and has made a very successful run up till the present time; 150 bushels charcoal and 3 tons raw ore are used to make 1 ton of metal; 15 loads charcoal are being received daily, and ore is being sent in briskly, for the digging and hauling of which from \$2.25 to \$2.75 are paid. Hunnewell Furnace blew in on the 22d of January, and made, till 1st of June, 2139 tons pig iron—124 days' run, which is a daily average of 17 tons—and the first 16 days in this month turned out 317 tons iron, being a daily average of 19.45 tons metal. She made in all, the first 140 days, 2456 tons good iron, being an average of 17.4 tons for the whole time. The manager, Col. S. Eifort, cut 18,860 cords wood the past winter, and has yet to cut, in order to clean up jobs, about 1000 cords; he is receiving 24 loads charcoal per day. The Latrobe, Keystone, Hamden and Cornelius (Lincoln) furnaces are all in for moderate blasts and doing unusually well. Low prices, long continued, bring a better grade of pig iron and larger yield. Care is given to quality of stock and work of furnace. The Buckeye Furnace will make a long blast, the depression of business not affecting her production. The Monroe Furnace still gives the best results as regards to yield, making some 18 tons daily. The Union Iron Company (the Washington and Monroe furnaces), Hamden and Buckeye furnaces have large stocks of ore, the former some 15,000 gross tons, while the other charcoal furnaces have small piles and desire only running stock. The Hamden Furnace, it is said, will arrange to try stonecoal next season if times do not change radically for the better. Her wood is scarce, ore abundant. The Latrobe Furnace probably will never blow again, being much out of repair and with little or no timber. She is rented this year to J. H. C. Cobb, and was put in operation at slight expense, not even a new hearth being added. The charcoal furnaces have a hard row to hoe, and but few in this country will be warm until pig iron is \$30 per ton at home. Of the stonecoal furnaces the Star and Fulton only are running. The Star made an exceptional start, making up to a daily yield of 12 to 13 tons No. 1 foundry metal the first fortnight, but has since fallen off and is now in mill iron. Is not receiving ore. The Fulton Furnace is not doing so well as could be desired, owing to poor material, and has very clearly demonstrated that cheap stock is dear. The Huron, Orange and Tropic are cold. Of the six furnaces in Jackson town but one, the Fulton, is getting ore. At the Wellston Furnace matters are *status quo*. The Eliza Furnace is in slow course of erection, and doubtless will not blow before late fall. The Wellston Company have concluded to remain idle, their expense having convinced them that by so doing they keep on the safe side—i. e., the profitable one. Have no stock, and probably will not receive any this year. The Milton Furnace is drying out her Whitwell oven, and will fill up and blow in within ten days. The blast will have preliminary heating in cast iron stove and go into the Whitwell with a temperature of 300 to 400 degrees. This is a new departure, but the results should be good. The com-



True Merit & Excellence is the Basis of all Success  
THE EUREKA  
STEAM AND HYDRAULIC PACKING.

The results of a long series of experiments made with a view of meeting all the requirements of a perfect packing. And we assert without any reservation that it is the best article of its kind yet invented. It is made of the best materials, is elastic, pliable, and does not become hard by use, consequently it easily takes out with removal of the packing. It is made in various sizes, and is formed in a form covered with a series of braids of fine wire, between which is placed a lubricative compound superior to anything ever before used for the purpose, and contains more lubricant than can be held in any manner, cut, flute or gum the rods, no matter how long they are, and thus air crevices are excluded. Every article which has used it, and we have received many testimonials from the proprietors of Mills, Factories, Iron Works, &c., that it is the most durable, efficient and cheapest packing they ever used. All we ask is a fair trial, knowing it will convince better than any words of ours. Orders promptly filled.

SYMONDS & CO., 120 Exchange Place, Phila.,  
Sole Manufacturers.

Or WICKERSHAM & CO., Gen'l Agents, 403 Library St., Phila.

REFRIGERATOR  
MANUFACTORY  
OF  
William Law,  
709 & 711 Third Avenue, N. Y.

PRICE LIST.

|        | Chest.        | Upright. |
|--------|---------------|----------|
| No. 1. | each, \$ 5.00 | 14.00    |
| No. 2. | 15.00         | 16.50    |
| No. 3. | 8.00          | 18.50    |
| No. 4. | 9.50          | 24.50    |
| No. 5. | 11.20         | 29.50    |
| No. 6. | 12.50         | 35.50    |
| No. 7. | 15.50         |          |

Discount to the trade. Illustrated catalogues sent on application. All kinds of Refrigerators made to order.

pany have a large stock of ore, 7500 tons, and are receiving 40 to 50 tons daily. Limestone ore, \$3 per ton; block, \$2.50—all paid in goods."

W. C. Kelly, an manufacturer, Louisville, is running full time and employs twenty-five men.

A new co-operative foundry has been undertaken at Louisville, known as the "Elexcisor," Messrs. Scanlon, Drew & Co., proprietors. They will start up next week with twenty hands, and be prepared to turn out the most approved make in stoves, hollowware, mantles, grates, sash weights, etc.

The Nelson (Bullitt county) Furnace was sold at public sale last month, the Bank of Louisville becoming the purchaser at \$10,000. The same party purchased the Belmont Furnace for \$11,300.

The rail mill at Swift's (Covington) Iron and Steel Works was put in motion Monday, giving employment to about 200 additional mechanics.

MISSOURI.

Thomas Green, slag smelter at Granby, in ten minutes less than eight hours, on a run of slag, produced 9000 lbs. of lead, or 110 pigs, which comes well up to the brag runs at Hopewell and Old Mines.

We quote the following from *Mines, Metals and Arts*. Our reports as to iron furnaces are a little different: "The furnace interests of Missouri are no worse off than similar interests in other states. Still, cinders require the statement that things are down to a low pass. The great decline in the value of charcoal irons has robbed Missouri of a trade in which she was nearly pre-eminent for many years. Large stocks of high priced charcoal pig are still held, and manufacturing cost is not now expected for it, even if sold in the smallest lots. Our lead furnaces became a host within the past ten years; nearly 65 lead furnaces are running in this State, but with a market upon which the best of lead falls, and can scarcely realize 5.14c. per pound, it is not to be supposed the smelters will pay a high price for ores. The Irondale Blast Furnace is blown out; the Iron Mountain will shortly follow. South St. Louis has done nothing for a long time. One Missouri, and the three Vulcans are alone running in St. Louis. A slight change is making in the Jupiter beneath the bell, not that this circumstance has any positive promise of an early blow-in. The Missouri zinc furnaces are running; so are the Martindale. The Carondelet is idle, and zinc low. Zinc ores of the best qualities only are admissible. The fact of an increase in the production of pig iron in Missouri from 59,717 tons in 1875 to 68,223 tons in 1876, finds probable explanation in the large consumption of Vulcan pig for use in its own converters. But six out of nineteen furnaces of 1875 are in blast in 1877, of which four are stonecoal furnaces."

The Groom Shovel Company, of St. Louis, write us that, having been shut down for three weeks to put in larger engine and double their number of hammers, their capacity is largely increased, and hereafter they will be able to fill their orders with greater promptness. They have much improved the standard of their goods, and added the item of solid steel shovels and spades.

GEORGIA.

The Pool and Rogers furnaces are for sale or to rent.

The Bear Mountain furnaces are abandoned.

American Tools in Berlin.

Collector Tutton, of Philadelphia, has received the following letter:

UNITED STATES CONSULATE GENERAL,  
BERLIN, June 12, 1877.

Hon. Assistant Secretary of State, Washington, D. C.—Sir: I have the honor to acknowledge the receipt of instructions Nos. 108 and 109, the latter having reference to the disposition made of my No. 249 in relation to the International Exhibition in this city.

In this connection I will not omit to make mention of the decided interest caused here by collections of locks and tools of American manufacture now on exhibition in this city, through the agency and in the buildings of the Berlin Association of Architects. As regards the former, it is conceded on all sides that no locks are made anywhere in this country that can compare with those exhibited, either in quality and workmanship or in cheapness, and with proper effort to introduce them they cannot fail to find an exclusive and profitable market in Germany.

Of the sets of tools exhibited, all of which are found most handy and perfectly finished, it is especially the axes and hatchets, so smoothly polished and varnished, with their suitable and practicable handles, and also the planes and augers, with their ingenious improvements, that met with favor and admiration. To find for the creditable specimens of American industry a market abroad is a subject well deserving the attention of our enterprising business men. A collection of articles of American furniture, from their excellent material as well as their substantial workmanship, is likewise exhibited, and receives much commendation. As there would seem to be no good reason why a market should not be found in this country, by reason of their superior merits, for these and other articles of our manufactures, I trust that it will not be deemed out of place if I have ventured briefly to bring the subject to your attention. I am, sir, your obedient servant,

H. KREISMAN, Consul General.

A Salt Lake correspondent of the Chicago *Inter-Ocean* says: "Last year we imported from the East 7500 tons of Pittsburgh coke; cost laid down here about \$30 per ton on the average. One of our largest smelters has ordered 1000 tons of English coke, soon to arrive in San Francisco in sailing ships, that will only cost \$21 per ton laid down at the furnace." The reason of this order is that the Union and Central Pacific roads charge such high freights from Pittsburgh that it is impossible to compete with ocean freights. The time will come when this question of freight will have to be regulated in a somewhat different manner than by allowing the whims or caprices of some general freight agent to control.

## The Patent Automatic Stokers

which were shown by Dillwyn Smith at the Centennial Exhibition in the British section, and obtained the medal and highest award, are now offered to the users of steam in the United States, by the "United States Automatic Stoker Co." under a license from Dillwyn Smith, for use on land boilers, with full confidence that the satisfactory results obtained in Great Britain and on the Continent of Europe (where over 1200 of them are in use), will be fully realized here. Some of these results are: The generation of from 25 per cent, and upward of steam from a given grate surface above what is obtained from the same quality of fuel fed by hand. The lessening of the cost of steam from 10 to 30 per cent, from being able with the Stokers to properly burn a lower priced fuel. The entire removal of the smoke nuisance. The lessening of the labor of the fireman. Their use also materially reduces the temperature of the fire room and also prevents the injury to the boiler caused by the contraction and expansion of the plates resulting from the frequent opening of the fire doors in hand firing. These and other advantages have secured their introduction into the boilers of many of the largest Mills and Iron Works in England and other countries, and we are now turning out an average of 10 machines per week. A few letters are given from some of those having them in use, the statements in which can be implicitly relied upon. For information respecting price, &c., apply to

THE UNITED STATES AUTOMATIC STOKER CO.

DILLWYN SMITH, President, 2 Chestnut St., Philadelphia.

LAND MACHINES,

From A. M. Collins, Son & Co., Factory, Third and Canal Streets, Philadelphia.

DILLWYN SMITH, Esq.—Dear Sirs.—April 3, 1877.—I have the pleasure to inform you that we have received your letter, and take pleasure in stating that they have proved entirely satisfactory to us. The saving in cost of fuel we estimate at 20 per cent., increased amount of steam fully compensated for the extra cost of the stoker, the saving the variation not being appreciable on steam gauge. Hoping you may be successful in introducing them into general use in this country, we remain

Yours, truly, A. M. COLLINS, SON & CO.

Wigan Coal and Iron Company.

Wigan, September 29, 1875.

Dear Sirs: I have pleasure in certifying that the

Stokers applied to our boilers at Kirkless have worked to our satisfaction, and have effected a saving in fuel, to the extent of 20 per cent. We have now 12 stokers in use for the range of 1000 tons per hour, & more for the range of 1500 tons per hour, yours truly, W. H. HEWLETT.

From J. R. Jones, Esq., Afoncon Paper Mills, Holywell.

Yours Stokers answer my purpose; without them I could not have obtained that regular supply of steam throughout the day. I formerly used coal; with the Stoker I use slack, and save 25 per cent. in cost of fuel. They are suitable for all boilers.

Yours, truly, E. SMITH CARSON.

Hurst Mills, Ashton-under-Lyne, September 20, 1875.

Dear Sirs: We have had your Patent Mechanical Stokers in our use for some time, and find them work to our entire satisfaction, and effect a considerable saving in coal.

Yours, respectfully, C. L. WHITTAKER & SONS,

Per W. THOMAS.

Note.—They have ten double Machines at Work.

## THE AMERICAN MACHINE COMPANY, Philadelphia, Pa., MANUFACTURERS OF

### SPECIALTIES OF LIGHT IRON WORK.



with Patent White Rubber Rolls, Galvanized Malleable Iron Frame Work, Bessemer Steel Springs, &c. Noted for Strength, Durability, Efficiency and Simplicity.

No. 2, Rolls 1 1/2 in. diam., 10 in. long. No. 2 1/2, Rolls 1 1/4 in. diam., 12 in. long.

No. 3, Rolls 1 1/2 in. diam., 12 in. long. No. 4, Rolls 2 1/2 in. diam., 12 in. long.



with valuable improvements over other style Machines. Patent Spring Arrangement and Clamping Device. Noted for Superiority of Finish and Practical Advantages. The leading Machine in the market.

Sizes (length of Rolls), 4 1/2 inch, 6 inch and 8 inch.

Rolls with 10, 12, 15, 18, 22, 26 and 30 flutes.



For Every Family, Apartment, Hotel, &c. Centennial Medal and Diploma. Send for illustrated circular to

L. Falk, 16th Street,

New York City.

For sale by the Hardware and House Furnishing Stores.

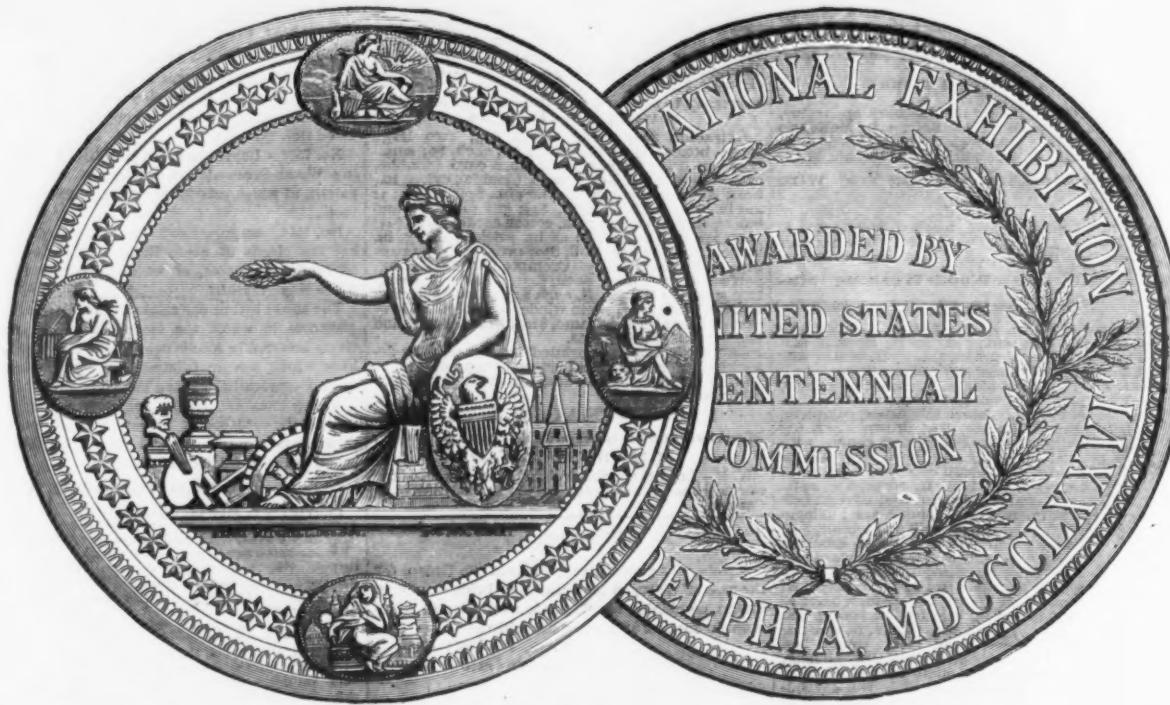
PERKINS and RHODE ISLAND PATTERNS OF

HORSE AND MILE SHOES.

OFFICE, 81 Canal Street, Providence, R. I.

# READING HARDWARE COMPANY, Reading, Pa.

Fac-simile of the Centennial Medal awarded by the United States Commission at the Exhibition held at Philadelphia, 1876, to the READING HARDWARE COMPANY, of Reading, Penn.,

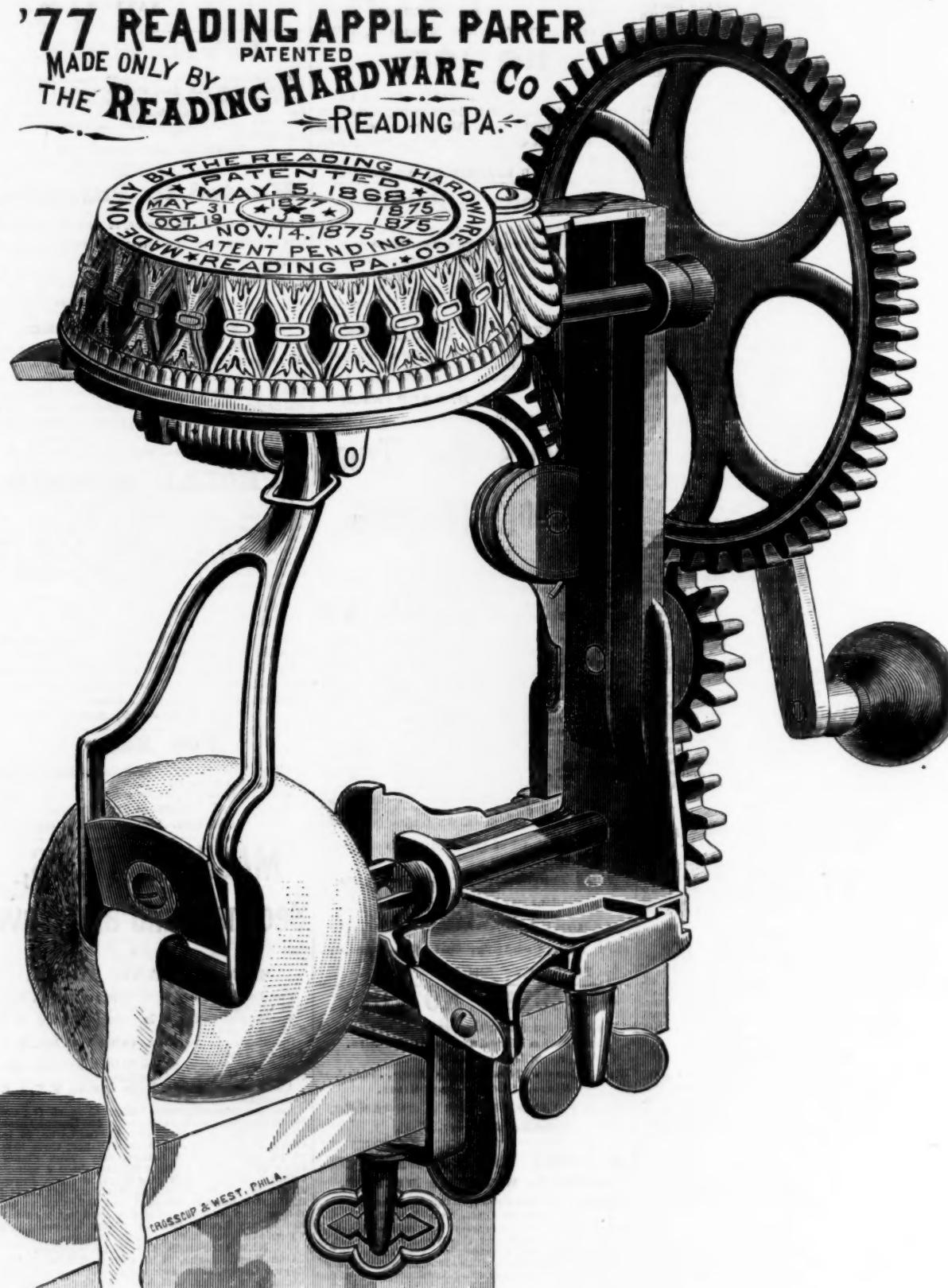


For their READING PATENT IMPROVED APPLE PARER, being the only Medal awarded to exhibitors of Apple Parers at the Exhibition, showing its superiority over all others on competition.

## '77 UPRIGHT PATENT READING APPLE PARER.

Most Complete Apple Paring Machine Ever Offered to the Public. With all the Latest Improvements.

'77 READING APPLE PARER  
PATENTED  
MADE ONLY BY  
THE READING HARDWARE CO.  
READING PA.



Reading Hardware  
Company,  
READING, PA.  
MANUFACTURERS OF:  
DOOR LOCKS  
AND  
Lock Furniture,  
BUTT HINGES,  
Axe and Frame Pulleys, Coat  
and Hat Hooks,  
THIMBLE SKEINS & PIPE BOXES,

As but a limited quantity of parers will be made the present season, orders should be sent early to be promptly filled.  
For terms and prices of Parers and other Hardware address

READING HARDWARE COMPANY, Reading, Pa.

4th. The movement being uniform, it takes off a thinner paring, while the direct action of the push-off lever removes the pared fruit without handling.

5th. The shafts, being square, cannot turn in the wheels of the machine.

6th. Each machine is packed separately in a paper box, rendering it less liable to injury in transportation and better adapted to the wants of the trade.

Together with a Full Line  
of

Japanned, Brass American,  
Dark Bronzed

AND  
Genuine Bronze Metal

## HARDWARE

in all the newest designs and  
in great variety.



# Trade Report.

Office of THE IRON AGE,  
WEDNESDAY EVENING, July 11, 1877.

The past week has not been as devoid of interest as those immediately preceding, although "the street" is enjoying a rather unusual degree of midsummer quiet. Money is still abundant, and rates on call are easy at 1 to 2 per cent. The rate of discount on prime business paper is 3 to 5 per cent.

The gold market has been dull and steady, with unimportant fluctuations, as shown in the following table:

|           | Highest. | Lowest. |
|-----------|----------|---------|
| Thursday  | 105 1/4  | 105 1/4 |
| Friday    | 105 1/4  | 105 1/4 |
| Saturday  | 105 1/4  | 105 1/4 |
| Monday    | 105 1/4  | 105 1/4 |
| Tuesday   | 105 1/4  | 105 1/4 |
| Wednesday | 105 1/4  | 105 1/4 |

Government bonds are strong. The feature of the week has been the large subscription for the new 4 per cent, making a total of over seventeen millions. The last treasury call is for \$10,000,000 5-20 six per cent bonds.

Railroad mortgages are strong and higher. We give below the closing quotations of governments.

The stock market has been strong, and through the influence of speculation prices have advanced. The principal dealings have been in Lake Shore, D., L. & W., Morris and Essex, St. Paul, Western Union, Michigan Central and Delaware and Hudson. We give below the closing quotations of active shares.

The bank statement is favorable, the total reserve having been increased \$1,839,800 and the surplus reserve \$708,700, the latter now being \$21,899,150. The most important change is in the increase in the specie average, and this is accounted for by the Treasury disbursements of July interest. The following is a comparison of the bank averages for the two past weeks:

|                | June 29.    | July 7.       | Differences.     |
|----------------|-------------|---------------|------------------|
| Loans          | \$4,663,600 | \$253,325,800 | Inc. \$1,668,200 |
| Specie         | 17,453,000  | 21,259,300    | Inc. 3,806,300   |
| Legal tend'r's | 60,150,500  | 58,447,000    | Dec. 1,902,500   |
| Deposits       | 226,485,200 | 231,288,600   | Inc. 4,740,400   |
| Circulation    | 15,561,100  | 15,558,100    | Dec. 35,100      |

The following tables show the foreign trade movements for the week:

FOREIGN IMPORTS.

For week ending July 7:

|                 | 1875.       | 1876.       | 1877.       |
|-----------------|-------------|-------------|-------------|
| Total for week. | \$4,342,507 | \$2,538,262 | \$5,408,653 |
| Prev. reported. | 183,115,531 | 159,985,495 | 171,185,387 |

Since Jan. 1...\$87,453,032 \$159,523,757 \$176,594,040

Included in the imports of general merchandise were articles valued as follows:

| Quantity.             | Value.  |         |
|-----------------------|---------|---------|
| Brass goods...        | \$8     | \$632   |
| Bronzes...            | 6       | 1,066   |
| Chains and anchors... | 16      | 898     |
| Copper...             | 119     | 436     |
| Cutlery...            | 94      | 18,737  |
| Guns...               | 19      | 4,336   |
| Hardware...           | 25      | 2,624   |
| Iron, pig, tons...    | 300     | 4,756   |
| Iron, 33 tons...      | 33      | 3,169   |
| Iron cotton ties...   | 107     | 534     |
| Iron, other, tons...  | 124     | 6,278   |
| Lead, pigs...         | 200     | 1,105   |
| Lead ashes, casks...  | 63      | 2,135   |
| Metal goods...        | 127     | 11,601  |
| Nails...              | 1       | 150     |
| Needles...            | 34      | 6,604   |
| Old metal...          | 28      | 8,824   |
| Pewter caps...        | 3       | 804     |
| Saddlery...           | 492     | 10,288  |
| Steel...              | 55,128  | 2,623   |
| Specter...            | 5       | 612     |
| Silverware...         | 18,342  | 165,490 |
| Tin, boxes...         | 105,017 | 16,828  |
| Tin, 1324 slabs...    | 61      | 634     |

EXPORTS, EXCLUSIVE OF SPECIE.

For week ended July 10:

|                 | 1875.       | 1876.       | 1877.       |
|-----------------|-------------|-------------|-------------|
| Total for week. | \$5,013,248 | \$7,170,806 | \$8,022,805 |
| Prev. reported. | 187,942,151 | 130,949,128 | 140,994,445 |

Since Jan. 1...\$132,955,399 \$138,120,024 \$145,927,340

EXPORTS OF SPECIE.

For week ended July 7:

|                      | 1875.      | 1876. | 1877. |
|----------------------|------------|-------|-------|
| Total for the week.  | \$801,584  |       |       |
| Previously reported. | 19,561,172 |       |       |

|                           | 1875.       | 1876. | 1877. |
|---------------------------|-------------|-------|-------|
| Total since Jan. 1, 1877. | \$1,162,705 |       |       |
| Same time in 1876...      | 21,564,023  |       |       |
| Same time in 1875...      | 26,604,201  |       |       |
| Same time in 1874...      | 20,945,518  |       |       |
| Same time in 1873...      | 30,997,318  |       |       |
| Same time in 1872...      | 39,202,456  |       |       |

Government bonds at the close were steady. We quote:

| Bid.                                | Asked.  |
|-------------------------------------|---------|
| U. S. Currency 6's... 123 1/2       | 123 1/2 |
| U. S. 6's 1881 registered... 111    | 111     |
| U. S. 6's 1881 coupon... 112 1/2    | 112 1/2 |
| U. S. 6's 1881 reg. 105 1/2         | 105 1/2 |
| U. S. 6's 1865 cont. 106 1/2        | 106 1/2 |
| U. S. 6's 1867 reg. 109 1/2         | 109 1/2 |
| U. S. 6's 1867 cou. 124             | 124     |
| U. S. 6's 1868 reg. 112 1/2         | 112 1/2 |
| U. S. 6's 1868 cont. 113            | 113     |
| U. S. 10-40 reg. 112 1/2            | 112 1/2 |
| U. S. 10-40 coupon 113 1/2          | 113 1/2 |
| U. S. 5's 1881 registered 113 1/2   | 113 1/2 |
| U. S. 4 1/2 1861 registered 117 1/2 | 117 1/2 |
| U. S. 4 1/2 1861 coupon 108 1/2     | 108 1/2 |
| U. S. 4 1/2 1861 registered 109     | 109     |
| U. S. 4 1/2 1861 coupon 108 1/2     | 108 1/2 |

The following were the closing quotations of active shares:

| Bid.                                       | Asked. |
|--|--------|
| Atlantic and Pacific Telegraph... 30       | 31     |
| Chicago and Northwest... 21                | 21 1/2 |
| Chicago, Rock Island and Pacific... 40 1/2 | 41     |
| Chicago, Bur. and Quincy... 95             | 95     |
| Clev. and Cle. and Ind... 25               | 27     |
| Cleveland and Pittsburgh... 81             | 81 1/2 |
| Chicago and Alton... 85                    | 85 1/2 |
| Canton... 18                               | 22     |
| Delaware, Lack. and Western... 40 1/2      | 41     |
| Delaware and Hudson Canal... 30 1/2        | 30 1/2 |
| Duluth and St. Louis City... 95            | 95     |
| Express... 44                              | 96     |
| American... 43 1/2                         | 44     |
| United States... 40 1/2                    | 43     |
| Wells, Fargo & Co... 81 1/2                | 82     |
| Erie... 67 1/2                             | 7      |
| Harlem... 138 1/2                          | 140    |
| Hannibal and St. Joseph... 13              | 14     |
| Illinois Central... 30 1/2                 | 31     |
| New York Central... 93 1/2                 | 93 1/2 |
| New Jersey Central... 91 1/2               | 91 1/2 |
| Ohio and Mississippi... 20 1/2             | 20 1/2 |
| Pacific Mail... 20 1/2                     | 20 1/2 |
| Panama... 65                               | 99     |
| Pittsburgh and Fort Wayne... 90 1/2        | 91     |
| Quicksilver... 13                          | 14     |
| Pre... 23 1/2                              | 24     |
| St. Louis and Iron Mountain... 9           | 10     |
| St. Louis Kansas City Northern... 34       | 4      |
| Pre... 23 1/2                              | 24     |
| Toledo, Wahab and Western... 63 1/2        | 65 1/2 |
| Union Pacific... 63 1/2                    | 65 1/2 |
| Western Union Telegraph... 61 1/2          | 61 1/2 |

## MINING STOCKS.

Mr. Ogden Haight, No. 65 Wall street, sends us the following report of the business of the New York Mining Stock Exchange for the week ending July 11:

|                          | Sales.          |
|--------------------------|-----------------|
| Alionex Mining Co.       | \$2,000 \$5,000 |
| Atlantic                 | 6,000 7,000     |
| Calumet & Hecla Min. Co. | 16,000 17,000   |
| Central                  | 30,000 40,000   |
| Franklin                 | 1,000 8,000     |
| Madison                  | 70,000 100,000  |
| Mesnard (ass't paid)     | 500 1,000       |
| Minnesota                | 1,000 1,000     |
| National                 | 25,000 40,000   |
| Oscella                  | 19,000 22,000   |
| Pewabic                  | 1,000 2,000     |
| Quincy                   | 35,000 36,500   |
| Ridge                    | 1,500 3,000     |
| Rockland                 | 1,000 1,000     |

GOLD STOCKS.

|                          | Sales.  |
|--------------------------|---------|
| Am. Flag G. M. Co., Col. | .07 .10 |
| Atlantic                 | 2,500   |
| Calumet                  | 1,000   |
| Central                  | 1,000   |
| Franklin                 | 1,000   |
| Madison                  | 1,000   |
| Mesnard (ass't paid)     | 1,000   |
| Minnesota                | 1,000   |
| National                 | 1,000   |
| Oscella                  | 1,000   |
| Pewabic                  | 1,000   |
| Quincy                   | 1,000   |
| Ridge                    | 1,000   |
| Rockland                 | 1,000   |

the stocks are not as a rule well assorted.

We quote rod to 60d., nominally, \$2.40. The American Screw Company have issued the following Circular:

PROVIDENCE, July 10, 1877.  
To the Hardware Trade. Until further advised we quote you the following discounts and terms on our New Patent Wood Screws, and terms on our Corrugated Wood Screws, for orders covering assortments in the usual proportions of sizes:

|                  | Dis. from list.     |
|------------------|---------------------|
| Flat Head Iron   | 60 and to per cent. |
| Flat Head Brass  | 55 "                |
| Round Head Iron  | 50 "                |
| Round Head Brass | 49 "                |

Terms cash thirty days from date of invoice.

Orders for assortments of unusual proportions will be executed at special rates, as may be agreed. All orders received subject to rates ruling when executed. Payments in funds at par in Boston, New York, Philadelphia or Baltimore.

Being prepared to furnish a full assortment of Screws, Machine Screws, Rivets, Stove Bolts, Tire Bolts, Coach Screws, &c., we solicit a continuance of your orders, which will have prompt attention.

AMERICAN SCREW CO.

The Stanley Rule and Level Company have just brought out a new Iron Block Plane for very small work. The plane is 34 inches long, with 1 inch steel cutter, and can be used to advantage in connection with fret-saw and scroll work, or similar kinds of fine work. It is a practical tool for mechanics, and will be used largely, too, by amateur workmen. The price is \$3 per dozen. Twenty-five and 10 per cent discount.

The Enterprise Manufacturing Company have advanced the list prices on their Sausage Stuffer, Fruit, Lard and Jelly Presses combined to correspond with improvements in the goods. They have also added some new styles and adopted a series of numbers. The list is as follows:

|                           | LEAD STOCKS. |
|---------------------------|--------------|
| SILVER STOCKS.            |              |
| TUNNEL COMPANIES.         |              |
| Boott Tunnel of Col.      | 3.00 4.00    |
| MISCELLANEOUS STOCKS.     |              |
| Smith & Farmer...         | .10 .20      |
| Uhlkirk of Col.           | .05          |
| United Petroleum Farms... | .05          |

the list remaining as before. On the 26th page we print a descriptive notice with illustration of this improved machine, to which we invite attention.

Fernald & Sise have taken the agency for Hoyt's Patent Window Fast, an illustration and notice of which will be found in another column. They quote these goods at the following list, which is subject to discount 25 per cent. The goods are packed in paper boxes of one dozen each:

HOYT'S PATENT WINDOW FAST.

|  | Per doz. |
|--|----------|
| No. 1, Bronze Knob, will suit meeting rails, 1 1/2 to 3 1/2  | \$4.00   |
| No. 2, Bronze Knob, will suit meeting rails, 3 1/2 to 4 1/2  | 4.00     |
| No. 3, Bronze Knob, will suit meeting rails, 4 1/2 to 5 1/2  | 4.00     |
| No. 10, Nickel Knob, will suit meeting rails, 1 1/2 to 2 1/2 | 4.00     |
| No. 11, Nickel Knob, will suit meeting rails, 2 1/           |          |

would prove to have been well timed, and people in Europe would arrive at the conclusion that thenceforward the United States are likely to continue larger absorbers of Tin. The demand for *Tin Plates* has been light, but prices have remained firm. This article at length seems to have arrived at a period of greater and lasting healthfulness. We quote, gold, per box, ordinary brands, large lines as follows: Charcoal Bright, \$6.62; to \$6.75; ditto Ternes, \$6 to \$6.12; Coke Tin, \$5.75 to \$5.87; and Ternes, \$5.50. Whatever there is of dullness for the moment should be attributed to the dull season merely. By mail from Liverpool we have the ensuing, dated June 28: "Some makers, whose orders are being worked pretty nearly through, show decided symptoms of meeting buyers to induce further specifications. If buyers hold off for a few weeks longer we hardly see that any other conclusion can be arrived at than that the need for orders will quite generally force makers to accept somewhere in the neighborhood of late low prices."

**Lead.**—Common Domestic has been quite nominal at 5.60c., currency. We hear of no sales whatever, nor can we trace the rumored transactions in Refined to a reliable source. Foreign is also getting to be cheaper, Spanish, cost, freight and insurance being quoted, per cable, at London, yesterday, £20.26, which is equal to 6.40c., gold, on the wharf at New York. By mail we have the following from the same quarter: "Supplies of Foreign keep up well in quantity, and as long as this is the case, we are not likely to have any advance. Little business is doing, rates nominally being: Spanish Pig, first fusion, £20; English Pig, £20.76; and Sheets, £22." Manufactured is in steady moderate demand at the late reduction; we quote: Bar, 7 $\frac{1}{2}$ c.; Pipe, 8 $\frac{1}{2}$ c.; Sheet, 9c.; and Tin Lined Lead Pipe, 16 $\frac{1}{2}$ , all less to per cent. to trade.

**Spelter and Zinc.**—Business in Domestic Spelter has been restricted to small lots within the range of 5 $\frac{1}{2}$ c. to 6 $\frac{1}{2}$ c., currency, as to brand, while in Foreign nothing has been done, and we quote the latter, nominally, 6 $\frac{1}{2}$ c. to 6 $\frac{1}{2}$ c., gold. Continental metal reports refer to some Swedish mining property which seems to add materially just at present to the Scandinavian Spelter output. We have on various occasions stated that production in Europe is just now outrunning consumption, and that this, together with the general depression over there, weighs heavily on the metal. The industrial accounts from Central Europe generally, received by the last mail, are most discouraging, and of course contribute not a little toward the weakness of all metals over there, including Spelter and Sheet Zinc. Nor is there any prospect for a speedy and somewhat lasting relief in this respect. Sheet Zinc is quiescent, Mosseman at 8c. to 8 $\frac{1}{2}$ c., gold, and Domestic at 7 $\frac{1}{2}$ c. to 7 $\frac{1}{2}$ c., currency.

**Nickel.**—Remains without feature at \$1.80 to \$1.90, gold, per pound.

**Antimony.**—Is quoted at London £48 to £52, as to brand; it is supposed, however, that the best might be procured at £51. A fair amount of sales is being effected here at 11 $\frac{1}{2}$ c. to 12c., gold.

#### COAL.

To the buyer the market presents very few features of interest. The amount of Coal coming to market is large, and stocks seem to be accumulating at the shipping points. From personal observation we judge that the stocks in cars and upon side tracks is also large and upon the increase. Prices of the smaller sizes are naturally sagging from week to week. Manufacturing Coals hold their own better, and the Lehigh Coals are reported firmer than the softer kinds. The volume of trade during the past week is about the same as last; one or two firms, however, with exceptionally favorable connections, report a decided increase, but this is more than balanced by the general reports. Retail dealers are becoming somewhat discouraged and are allowing their stocks to run down, finding that they can be replaced at very low figures. Manufacturers, on the contrary, are buying largely. They keep up their stocks by putting in Coal whenever they have room. A large proportion of the Coal sold goes to this class of buyers.

#### IMPORTS

*Of Hardware, Iron, Steel and Metals into the Port of New York for the Week ending July 10, 1877.*

##### Hardware.

Boker Hermann & Co. Mdse., pkgs. 5 Packages, 14 Full Bros. Cutlery, cks. 2 Fire irons, cks. 2 Razors, cks. 2 Axes, 2 Field A. & Co. Wire, cks. 3 Casks, 2 Moore's J. P. Sons. Wadding, cks. 13 Per. caps, cks. 1 McCoy & Co. Cases, 9 Parrot & Horace & Co. Cases, 11 Peters Bros. Mdse., pkgs. 6 Schoverling & Daly Mdse., pkgs. 4 Schall & Co. Cases, 4 Wiebisch & Hilger Hdw. Co. Cutlery and hrdw', pkgs. 20 Order. SICKLES, cks. 3 Shot, cks. 6 Casks, 1 Cases, 3 GUNS, cks. 2 Packages, 13

##### IRON.

Currie W. & F. P. Pig, tons, 150 Moore's J. P. Sons. Bubbles, 234 Bars, 21 Phelps, D. Ig. & Co. Case, 1, bbls. 157 Bubbles, 21 Whitmey A. R. & Bros. Flues, 512 Order. Pig, tons, 300 Spiegel, tons, 293 $\frac{1}{2}$  Spiegel, lots, 1

##### STEEL.

Dowell, William Bars, 147 Cases, 5 Casks, 1

#### EXPORTS

*Of Hardware, Iron, Machinery, Metals, &c., from the Port of New York, for the Week ending July 11, 1877:*

**Danish West Indies. British West Indies**

Quan. Value. Quan. Value.

Hdw., pkgs... 14 \$171 Clocks, cts.... 4 \$220

**Hamburg.** Tinware, cts.... 2 110

Agl. Imp., pkgs... 34 2216 Car. wares, pgs... 6 259

Mf. of iron, cts.... 7 203 Car. stat., 195 13 359

Machy., pkgs... 7 203 Hdw., pkgs... 12 321

Sew. Mach., cts 213 24,218 Lamps, pkgs... 99

Hdw., pkgs... 52 253 Nails, kegs.... 130 376

Windmills, cts 79 1400 Hdw., pkgs... 27 366

Pumps, cts.... 17 736 Nails, kegs.... 14 45

Chocks, cts.... 153 1,521 Bolting, case... 1 202

**British Honduras.** Best Bloom, 6c. to 4c.; and Best Bloom, 6c. to 6c.

**British Possessions in Africa.** Sheet—Common American, No. 6 to 17c. to 3c.; No. 18 to 28, 3 $\frac{1}{2}$ c. to 34c.; Best

Best Charcoal Bloom, No. 6 to 20, 5 $\frac{1}{2}$ c.; No. 22 to 28, 5 $\frac{1}{2}$ c. to 6c.; Philadelphia Russian, 8c.

**Bremen.** Grindstones, 36

Agl. Imp., pkgs... 366 Clocks, cts.... 28 2646

Machy., pkgs... 1482 Cutlery, cts.... 7 359

**Rotterdam.** Mf. of iron, pgs... 50 Cutlery, cts.... 6 50

Hdw., cts.... 81 1664 Clocks, cts.... 13 240

Pumps, cts.... 100 839 Wire, bxs.... 941 12,490

Ag. Imp., pkgs... 8 440 Marseilles.

Coal, tons... 303 846

**Lisbon.** Clocks, bxs.... 50 665

**Havre.** Machy., cts.... 10 1593

Ag. Imp., pkgs... 737 27,125

Clock, bxs.... 13 240

**New Zealand.** Cutlery, cts.... 6 50

Hdw., cts.... 81 1664

Pumps, cts.... 100 839

Ag. Imp., pkgs... 8 440

**Glengow.** Car. mts, pgs... 7 875

Pistols, cts.... 2 1000

Em'y wh's, cts.... 1 200

**London.** Hdw., pkgs.... 5 157

**Hayti.** Lamps, pkgs.... 4 105

Clocks, bxs.... 10 130

Iron safe.... 20 332

Machy., cts.... 20 120

Ag. Imp., pkgs... 5 325

Mf. of iron, pgs... 43 302

Wheels, cts.... 14 973

Car. mts, cts.... 10 470

Car. m

## ST. LOUIS.

Specially reported by Messrs. SPOONER & COLLINS, Iron commission merchants, 217 North Third street, St. Louis, under date of July 5: Market very dull, and hardly anything doing. Nearly all of our mills and foundries are closed for two or three weeks. Prices unchanged:

|  | White<br>and<br>Black<br>Charcoal | No. 1, No. 2, Mill.<br>Mot'd | White<br>and<br>Black<br>Charcoal | No. 1, No. 2, Mill.<br>Mot'd |
|--|-----------------------------------|------------------------------|-----------------------------------|------------------------------|
| Missouri Stone Coal                    | \$23.00                           | \$22.00                      | \$21.50                           | \$20.00                      |
| Missouri Charcoal                      | 23.00                             | 22.00                        | 23.00                             | 20.00                        |
| Southern Coke, very soft<br>and strong | 23.00                             | 22.00                        | 23.00                             | 22.00                        |
| Hanging Rock Charcoal                  | 25.00                             | 23.00                        | 22.00                             | 22.00                        |
| H. R. Charcoal, Cold-<br>short         | 25.00                             | 24.00                        | 25.00                             | 24.00                        |
| Alice H. R. Coke                       | 25.00                             | 25.00                        | 24.50                             | 23.00                        |
| Quinnimont, West Vir-<br>ginia, Coke   | 25.00                             | 24.00                        | 23.50                             | 22.50                        |

COLD BLAST CHARCOAL—All Numbers.

|                     |         |       |        |        |
|---------------------|---------|-------|--------|--------|
| Hanging Rock        | \$25.00 | 40.00 | 4 mos. |        |
| Tennessee           | 28.00   | 60.00 | 4 mos. |        |
| Kentucky            | 28.00   | 60.00 | 4 mos. |        |
| Missouri            | 28.00   | 60.00 | 4 mos. |        |
| Georgia             | 28.00   | 60.00 | 4 mos. |        |
| Alabama             | 28.00   | 60.00 | 4 mos. |        |
| Assorted Bar Iron   | 65.00   | 21.00 | 4 mos. |        |
| No. 1 Wrought Scrap | 60.00   | 21.00 | 4 mos. |        |
| No. 1 Railroad      | 1.00    | 00    | 4 mos. |        |
| Machinery Cast      | 1.00    | 00    | 4 mos. |        |
| Light Cast          | 1.50    | 00    | 4 mos. |        |
| Old Rails           | 18.50   | 60.00 | 19.50  | 4 mos. |
| Old Car Wheels      | 18.00   | 60.00 | 19.00  | 4 mos. |

## CINCINNATI.

Messrs. L. R. HULL & Co., under date of July 7, write us as follows: We are able to note a somewhat improved demand for Foundry Irons, and large lots have been placed since last report. The inquiry for some grades of Mill Iron is better, but the demand is generally slack for Forge Irons. Prices remain unchanged:

| HOT-BLAST FOUNDRY.                |                               |
|-----------------------------------|-------------------------------|
| Hanging Rock No. 1, Char-<br>coal | 20 ton \$24.50 @ 24.50—4 mos. |
| Hanging Rock No. 2, Charcoal      | 22.00 @ 22.50—4 mos.          |
| " No. 1 Coke                      | 23.50 @ 24.50—4 mos.          |
| " No. 2                           | 22.00 @ 22.50—4 mos.          |
| " No. 1, Stone-<br>coal           | 21.00 @ 22.00—4 mos.          |
| Virginia, No. 1 Coke              | 24.00 @ 24.50—4 mos.          |
| " No. 2                           | 22.50 @ 23.00—4 mos.          |
| Ala. and Tenn., No. 1 Charc'l     | 23.00 @ 4—4 mos.              |
| " No. 2                           | 21.50 @ 22.50—4 mos.          |
| Red-short, No. 1 Coke             | 22.00 @ 22.50—4 mos.          |
| Fannie U. S. Scotch No. 1         | 23.00 @ 24.50—4 mos.          |
| Alice S. Scotch No. 1             | 24.50 @ 24.50—4 mos.          |
| Am. Scotch No. 1                  | 21.00 @ 22.00—4 mos.          |

| FORGE IRONS.                      |                               |
|-----------------------------------|-------------------------------|
| Hanging Rock No. 1, Char-<br>coal | 20 ton \$24.50 @ 24.50—4 mos. |
| Hanging Rock No. 2, Charcoal      | 22.00 @ 22.50—4 mos.          |
| " No. 1 Coke                      | 23.50 @ 24.50—4 mos.          |
| " No. 2                           | 22.00 @ 22.50—4 mos.          |
| " No. 1, Stone-<br>coal           | 21.00 @ 22.00—4 mos.          |
| Virginia, No. 1 Coke              | 24.00 @ 24.50—4 mos.          |
| " No. 2                           | 22.50 @ 23.00—4 mos.          |
| Ala. and Tenn., No. 1 Charc'l     | 23.00 @ 4—4 mos.              |
| " No. 2                           | 21.50 @ 22.50—4 mos.          |
| Red-short, No. 1 Coke             | 22.00 @ 22.50—4 mos.          |
| Cold-short, No. 1 Scotch          | 19.00 @ 20.00—4 mos.          |

| CAR WHEEL AND MALLEABLE.          |                               |
|-----------------------------------|-------------------------------|
| Hanging Rock No. 1, Char-<br>coal | 20 ton \$24.50 @ 24.50—4 mos. |
| Hanging Rock No. 2, Charcoal      | 22.00 @ 22.50—4 mos.          |

| ORE.                       |      |
|----------------------------|------|
| Lake Superior              | 8.50 |
| Virginia Hematite (Washed) | 4.25 |

## CHATTANOOGA.

Specially reported by S. R. Lowe, dealer in Metals, under date of July 9: Notwithstanding a concession in prices there has been considerable activity in metal during the past week. The foundry grades are moving freely, and no trouble is experienced in making sales. Business appears to be quite brisk with most of the Southern foundries, and a feeling of improvement in business prevails.

| COKE.                |                 |
|----------------------|-----------------|
| No. 1 Foundry, extra | \$20.00 @ 21.00 |
| No. 1 Foundry        | 19.00 @ 20.00   |
| No. 2 Foundry        | 17.00 @ 18.00   |
| Gray Forge           | 15.00 @ 16.00   |
| White and Mottled    | 14.00 @ 15.00   |

| HOT-BLAST CHARCOAL.                              |                 |
|--|-----------------|
| Car Wheel Metal                                  | \$22.50 @ 22.50 |
| " extra standard                                 | 22.50 @ 22.50   |
| Forge Metal                                      | 17.50 @ 20.50   |
| Muck Bar   | 20.00 @ 31.00   |
| Old Car Wheels                                   | 17.00 @ 20.00   |
| Old Rails per ton                                | 16.00 @ 17.00   |
| Brown Hematite Ore 50 to 55 per cent. per ton    | 1.75 @ 2.25     |
| Red Fossiliferous Ore 50 to 55 per cent. per ton | 1.50 @ 1.75     |

| COLD-BLAST CHARCOAL.                             |               |
|--|---------------|
| " extra standard                                 | 22.50 @ 22.50 |
| " standard                                       | 22.50 @ 22.50 |
| Forge Metal                                      | 17.50 @ 20.50 |
| Muck Bar   | 20.00 @ 31.00 |
| Old Car Wheels                                   | 17.00 @ 20.00 |
| Old Rails per ton                                | 16.00 @ 17.00 |
| Brown Hematite Ore 50 to 55 per cent. per ton    | 1.75 @ 2.25   |
| Red Fossiliferous Ore 50 to 55 per cent. per ton | 1.50 @ 1.75   |

| HOT-BLAST CHARCOAL.                              |               |
|--|---------------|
| " extra standard                                 | 22.50 @ 22.50 |
| " standard                                       | 22.50 @ 22.50 |
| Forge Metal                                      | 17.50 @ 20.50 |
| Muck Bar   | 20.00 @ 31.00 |
| Old Car Wheels                                   | 17.00 @ 20.00 |
| Old Rails per ton                                | 16.00 @ 17.00 |
| Brown Hematite Ore 50 to 55 per cent. per ton    | 1.75 @ 2.25   |
| Red Fossiliferous Ore 50 to 55 per cent. per ton | 1.50 @ 1.75   |

| HOT-BLAST CHARCOAL.                              |               |
|--|---------------|
| " extra standard                                 | 22.50 @ 22.50 |
| " standard                                       | 22.50 @ 22.50 |
| Forge Metal                                      | 17.50 @ 20.50 |
| Muck Bar   | 20.00 @ 31.00 |
| Old Car Wheels                                   | 17.00 @ 20.00 |
| Old Rails per ton                                | 16.00 @ 17.00 |
| Brown Hematite Ore 50 to 55 per cent. per ton    | 1.75 @ 2.25   |
| Red Fossiliferous Ore 50 to 55 per cent. per ton | 1.50 @ 1.75   |

| HOT-BLAST CHARCOAL.                              |               |
|--|---------------|
| " extra standard                                 | 22.50 @ 22.50 |
| " standard                                       | 22.50 @ 22.50 |
| Forge Metal                                      | 17.50 @ 20.50 |
| Muck Bar   | 20.00 @ 31.00 |
| Old Car Wheels                                   | 17.00 @ 20.00 |
| Old Rails per ton                                | 16.00 @ 17.00 |
| Brown Hematite Ore 50 to 55 per cent. per ton    | 1.75 @ 2.25   |
| Red Fossiliferous Ore 50 to 55 per cent. per ton | 1.50 @ 1.75   |

| HOT-BLAST CHARCOAL.                              |               |
|--|---------------|
| " extra standard                                 | 22.50 @ 22.50 |
| " standard                                       | 22.50 @ 22.50 |
| Forge Metal                                      | 17.50 @ 20.50 |
| Muck Bar   | 20.00 @ 31.00 |
| Old Car Wheels                                   | 17.00 @ 20.00 |
| Old Rails per ton                                | 16.00 @ 17.00 |
| Brown Hematite Ore 50 to 55 per cent. per ton    | 1.75 @ 2.25   |
| Red Fossiliferous Ore 50 to 55 per cent. per ton | 1.50 @ 1.75   |

<table border

license for the use of steam or other mechanical power for moving carriages on any tramway in Great Britain, with the exception of the London area, which is under the control of the Metropolitan Board of Works. This solves a question which has hitherto proved a vexed one—particularly in the larger provincial towns.

## STAFFORDSHIRE AND BIRMINGHAM.

The quarterly meetings are again drawing near, but up to the time of writing no positive movement has been made which might lead to the inference that prices are to be lowered. At the same time all quotations are so weak and are being undersold to such an alarming extent that it is quite within the bounds of possibility that some of the best marked iron may be declared down to the extent of 10 or even 15 per ton. At present branded bars are all nominally maintained at £9 per ton, with the traditional 12/6 extra for Lord Dudley's bars and other finished iron in proportion. None of the Staffordshire iron works, however, are anything like half engaged, particularly in the Darlaston and Bilston districts, where thousands of workmen are unemployed and large collections of valuable plant totally idle. Sheets are, perhaps, selling better than any other kinds of merchant iron; some of them for the use of the hardware producers, and some in a galvanized state for export to Australia, New Zealand, India and the Cape. There is, too, a fair inquiry for agricultural and builder's ironwork, mostly, in both cases, on home account. The edge tool manufacturers are selling goods somewhat freely for the leading colonies, and there is said to be a slight improvement in the United States demand for chains, tin plates, fish hooks and birding guns. The hollowware manufacturers are pretty well engaged, and at their quarterly meeting on Thursday last resolved to make no change in prices. Nickel (reduced) is now 5 per lb.

## SOUTH WALES AND MONMOUTHSHIRE.

The coal trade of South Wales remains in a most prosperous condition, albeit profits are said to be somewhat problematical. Last week no fewer than 131,184 tons were sent off from the Welsh ports. Cardiff alone contributed 104,000 tons of the aggregate. There is, nevertheless, some uncertainty as to the continuance of this state of things, owing to the wages question already alluded to in this letter. The iron trade is very quiet, although last week's shipments were close upon 10,000 tons, mostly for India, Sweden and Canada. It is stated that the French, who are the best buyers of Welsh tin plates, are trying to make the plates themselves. Some cargoes of black plates have already been sent to France to be finished there.

## THE METAL MARKETS

have been quiet, but with no particular change in quotations.

Messrs. Von Dadelzen & North say: "Copper is quiet; Chili bars, g. o. b. have realized £69, while for parcels in Swansea, £69, 10/- has been paid. At the ticketings on Thursday, Cape ore went at 13, 10/-, the average of the whole sale being 13, 6/- per unit. Wallaroo is still withheld from the market; trifling lots from second hands fetch high rates. Burra is quoted at £75 to £75, 10/-, with little passing; English tough quoted £74, 10/- to £76; select, £76 to £77; strong sheets, £8; India sheets, £8. Tin is rather easier; small sales of Straits at £68, 5/-, while a fair quantity of Australian has been sold at £67, 10/- to £67, 15. Dutch market quiet; Banca, 42fl.; Biliton, 41fl. English ingot, £72 to £73. Tin Plates are firmly held, but demand is slack. Lead, dull; English pig, £20, 7/6 to £20, 10/-; soft Spanish, £20, to £20, 2/6. Spelter—Nothing doing; Silesian quoted £19, 15/- to £20. Quicksilver was reduced to £7, at which price a good business was done; the importer now asks £7, 5/- for Spanish. Antimony, £48."

Messrs. Kelly & Co. report thus: "The metal market is still afflicted by weakness and indecision. The production of pig iron goes on as wondrously large as ever, if not larger. This enigma at present is only to be solved in the supposition that it answers somebody's purpose thus to go on making it. We are told openly and continually that this is not so—that the 'surroundings of iron making kill it.' If this be true either in whole or in part we can say about it without giving offence to iron magnates, is that iron making takes 'a deal of killing,' and that we don't believe that the patient is at all likely to die at present. The multiplication of 'pigs' will have to go on. Iron must be obtainable cheaply. It will be so; and it being so the chances are in favor of a larger and still larger consumption of a material which is the only great substitute for wood, which is constantly getting dearer. 'Constructive iron' is astonishing on the increase. The requirements for the annual 15,000 new houses of London and its environs, in the aggregate, represent a great deal; but when it can be seen everywhere, even in remote places, entering comparatively humble buildings on the score of economy a little bright light is thrown upon the question recently somewhat puzzling, as to how it is, with iron exports materially diminished of late years and a 'larger present make' (without much 'going into stock'), the home consumption has increased."

The *Mining Journal* remarks: "The general appearance of our markets is without change, but in places a little speculative feeling has prevailed this week, arising more, perhaps, from unmet capital than anything else; but as it might increase, it ought not to be overlooked, especially as the course of the money market invariably exerts a considerable influence over our markets, but more particularly when there is any disposition to speculate, for the rate at which money can then be obtained forms one of the principal items to be taken into calculation. A speculator should form his own judgment as to the increase of business and consequent risks, and be firm in his decisions, and either act promptly or do nothing at all—hesitate is always fatal. We abstain from any expression of opinion here, because we do not think anything of sufficient importance has transpired yet awhile to necessitate our giving one, and we will add no more than our usual warning—be cautious, and do not be over sanguine about results, and then there will be less disappointment in the event of a failure, but we would advise moderation should prices im-

prove. A small profit with quick returns is the best principle to act upon at most times, but there are many reasons just now why sellers should not be too exacting, and if they are successful in obtaining a slight turn of the market in their favor they should be careful not to injure trade by demanding too much. Copper.—The fluctuations in the value of this metal from day to day have been trifling, for the most part not exceeding 5 per ton. Tin.—The deliveries for the first half of this month, so far as can be ascertained, have been very fair, and the arrivals as yet have been very small, probably about a tenth only of the deliveries. The markets are quiet and very steady, but in the age of telegraphy there is no dependence upon them from one day to another, and although they may be nothing transpired to-day to outwardly influence them either one way or the other, yet to-morrow's news might create great excitement. Since the same means of judging of the merits of this metal are as much open to one as to another, we feel there is no occasion to offer any remarks of our own as to the advisability of buying or selling at the present moment, as the nature and extent of the risks on either side are pretty generally known and understood. Quicksilver.—At the beginning of the week £7 was accepted for Spanish, but on Tuesday the price improved 2 6 per bottle, and on Thursday offers below £7, 5/- were declined. To-day sellers of Spanish are indifferent about selling even at the highest price, and there appears little chance of doing better. Tin Plates.—Prices have been quoted slightly higher, but orders cannot be obtained at the advance, and makers have had to give way again. Common Coke are obtainable at 17 6 to 17 9. Lead.—The price of English is quoted 5 per ton lower, and the market remains very dull."

There is no change at Liverpool.

Iron: f. o. b. in Liverpool, per ton.

|                        | £ s. d. | £ s. d.   |
|------------------------|---------|-----------|
| Merchant bar, in Wales | 6 10    | to 6 12   |
| Staffordshire          | 6       | 0 to 6 5  |
| Hoop.                  | 7       | 0 to 9 15 |
| Sheet.                 | 7 10    | 0 to 8 0  |
| Nail rod.              | 8 15    | 0 to 8 15 |
| Bar, best crown.       | 7 0     | 0 to 8 0  |
| Boiler plates.         | 9       | 0 to 10 0 |

Tin Plates: f. o. b. in Liverpool, per box.

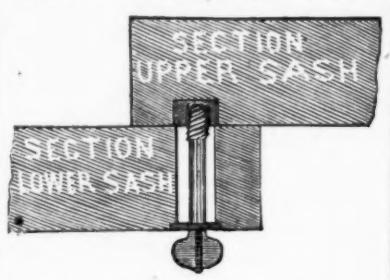
|                    | £ s. d. | £ s. d.  |
|--------------------|---------|----------|
| Charcoal, L. C.    | 1 2     | 6 to 1 4 |
| Coke, I. C.        | 1 8     | 0 to 1 0 |
| Bolt and sheathing | 8 4     | 0 to 0 0 |
| Tile.              | 7 8     | 0 to 0 0 |
| Tough cake.        | 7 8     | 0 to 0 0 |
| Best selected.     | 7 8     | 0 to 0 0 |

Copper: Delivered in Liverpool, per ton.

|                    | £ s. d. | £ s. d.  |
|--------------------|---------|----------|
| Charcoal, L. C.    | 1 2     | 6 to 1 4 |
| Coke, I. C.        | 1 8     | 0 to 1 0 |
| Bolt and sheathing | 8 4     | 0 to 0 0 |
| Tile.              | 7 8     | 0 to 0 0 |
| Tough cake.        | 7 8     | 0 to 0 0 |
| Best selected.     | 7 8     | 0 to 0 0 |

## Hoyt's Patent Window Fast'.

We show in the accompanying illustration a new, simple and very effective sash fastener, styled Hoyt's patent sash fast. It draws the meeting rails firmly together, thus preventing rattling, and keeps out air, dust or snow. It is made all of brass, excepting the knob, which is bronze or nickel, as desired. It is made, also, to be worked



with a key instead of a knob; is easily put on without removing the sash, the only tools required being a 7/16 inch auger bit and screw driver. Three lengths are made to suit the various thickness of sash, and each length will answer for three sizes of meeting rails. In our Trade Report, under the heading of General Hardware, particulars regarding the price of these goods will be found. Messrs. Fernald & Sise, No. 100 Chambers street, are sole agents.

## An Important Decision.

Surrogate Abram H. Dailey, of Kings county, delivered a decision in Brooklyn a few days ago which is of importance to gas companies, railroad corporations, and to executors of wills in which stock in such corporations associations is devised. It is the first of its kind delivered in the State of New York, and determines a question much discussed by lawyers, namely, the right of such companies to declare dividends on the proceeds of the sale of material, real estate, or privileges under a franchise, and the other question involved in the above, viz., What is capital and what is income from stock in such corporations? Sarah Demorest, a resident of Kings county, died in 1869, leaving her property, consisting of stock in the Brooklyn City Railroad Company and the Brooklyn Gas Light Company to her sister Eliza Demorest. The trustees of the will were Edward M. Schoenmacher and Charles Frederick. The property was left to Eliza Demorest for her life-time only, and was then to be distributed among a number of heirs named in the will. It was also provided that the executors could retain the stock, or sell it and reinvest in the same or stock of a similar kind, but it was not to be realized in cash during the life-time of the life tenant. While Eliza Demorest was living, the Brooklyn Gas Company sold out some of its main meters, and all its right to supply consumers within certain limits to two other companies. On the proceeds of this sale a dividend of 75 per cent. was declared to the stockholders, \$500,000 being the price or value of the material, and \$1,000,000 the estimated earnings in the relinquished district for a certain number of years named in the sale. The executors took these dividends in stock of the Nassau Gas Company in lieu of cash and sold them. They did not look upon them as income, but as a portion of the original principal, and hence they were not passed over to the life tenant. The latter died on the 4th of June, 1876, and the executors applied for a final settlement before ex-Surrogate Veeder on the 26th of September, 1876. The matter went over until January 4th last, and was

settled by ex-Surrogate Walter L. Livingston to W. H. Clements as Auditor. The family of Eliza Demorest claimed that the stock in the Nassau Gas Company belonged to the life tenant as income. The executors under the original will claim that it was principal, and that she had, therefore, no right to it. N. H. Clements reported that the proceeds of the sale was in his judgment principal, and not income, and that the life tenant had no right to it. Surrogate Dailey confirmed this view, in an elaborate opinion, delivered recently. He holds that "dividends are only income when derived from the usual transactions incident to the objects and purposes of a corporation, and not when they are derived from a sale of its material or rights under a franchise granted to them." "A company," he says, "may sell its entire property and declare a dividend among its stockholders, and still certificates of stock be held as before. But what would they represent? If these extraordinary dividends should be treated by executors as income, and paid under a will to a life tenant, they could treat the proceeds of the sale of the entire property in the same way, and there would be nothing to pass to other heirs carefully named and provided for in a will."

Iron for Brazil.—The *Tribune* says: There are indications that the United States is about to enjoy an iron trade with Brazil.

The bark Matthew Baird has cleared from Wilmington loaded with iron rails, and another vessel is to follow with a similar cargo.

A Pennsylvania firm has secured a contract for railroad iron, and will ship some this summer.

Wilmington has orders for a large number of cars, ten of them being for the Dom Pedro II railway. A few locomotives have also been ordered. Then there is a growing business in street railway material.

Years ago Stephenson sent cars and rails to Brazil, but lost the business at once, owing to English competition.

An American who went to Liverpool and set up a street car establishment there was able to undersell Stephenson in South America.

His cheaper labor in England and better ocean transportation enabled him to drive Americans out of the market.

Latterly orders have begun to seek the American establishments again.

Wheels and other material are being ordered from this city, and a business in rails and cars is confidently expected.

There is no reason why a large business should not be done in this line.

Railway material, delivered at the

seaboard in the United States, may possibly cost a trifle more than in English ports, but there is something to offset this.

Railway iron is a desirable class of ocean freights because it can be put into the hold of a ship and assist in steady the vessel—a matter of some consequence when the bulk of the cargo is of flour, as it generally is, and the ship therefore top heavy and uneasy in the water.

The desirability of railway material to the ship as freight and the shorter ocean route from New York to Brazil, will enable the stuff to be landed at ports beyond the Equator every dollar as cheaply as European material.

A letter from Birmingham, Ala., to the Louisville *Courier-Journal* says: The Red Mountain range is a solid mass of iron ore of fine quality. At one place the bank had been opened, and thousands of tons were piled up waiting to be transformed into useful articles. A company has been formed in Birmingham, and will shortly erect a furnace and rolling mill and utilize a portion of this iron deposit. I say a portion, for in the county in which Birmingham is situated I am told that there are twenty-five miles of the Red Mountain range which are nearly all solid ore. In this section of the State the deposits of coal and iron ore are immense enough to supply the world for ages. The question was, Could the coal be used to manufacture the iron? Making iron with charcoal was too costly a process. The Eureka Company, composed mainly of Louisville and Cincinnati capitalists, undertook to solve the problem, and established a furnace at Oxmoor, and did solve it in a most satisfactory manner. The coal makes the finest sort of coke.

## WILSON BOHANNAN,

Manufacturer of Patent

## BRASS

## Pad Locks,

FOR

## Railroad Switches,

## Freight Cars,

AND THE HARDWARE TRADE

All sizes, with Brass and Steel

Keys, with and without chains.

PASSENGER CAR LOCKS,

Bronzed, Nickel-Plated and Japanned.

BROOKLYN, N. Y.

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Patented 1875 by

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**TACKS, LINING**  
UPHOLSTERS, GIMP, CARPET, BRUSH TACKS, CIGAR BOX, FINISHING, TRUNK AND CLOUT, CHAIR NAILS, BRAIDS AND PATENT BRAIDS, SHOE NAILS, CHAIN TACKS, BRASS, SILVER, AND JAPANNED, LINING NAILS, SADDLE NAILS, TUFTING TACKS, COLOR, OF ANY AND NAILS.

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Manufactured by

**L. COES & CO.,**  
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Established in 1859.  
Registered March 21, 1874.



We invite the particular attention of the trade to our New Straight Bar Wrench, widened, full size of the larger part of the so called "reinforced or jag bar." Also our enlarged jaw, made with ribs on the inside, having a full bearing on the front of bar (see sectional view), making the jaw fully equal to any strain the bar may be subjected to.

These recent improvements in combination with the nut inside the ferrule firmly screwed up flush, against square, solid bearings (that cannot be forced out of place by use), verifies our claim that we are manufacturing the strongest Wrench in the market.

We would also call attention to the fact, that in 1869 we made several important improvements (secured by patents), on the old wrench previously manufactured by L. & A. G. Coes which were at once closely imitated and sold as the *Genuine Wrench* by certain parties who seem to rely upon our improvements to keep up their reputation as manufacturers, and although the fact of their imitating our goods may be good evidence that we manufacture a superior Wrench, we wish the trade may not be deceived on the question of originality. Trusting the trade will fully appreciate our recent efforts, both in improvements on the Wrench and in the adoption of a Trade Mark, we would caution them against imitations. None genuine unless stamped

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**HORACE DURRIE & CO., Sole Agents.**

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Manufacturers of  
**BEST IRON-STEEL AXES**  
AND EDGE TOOLS.  
Horace Durrie & Co., Agents, New York.

**HOGEN ELBOW COMP'Y,**  
MANUFACTURERS OF PATENT  
**Sheet Metal Elbows.**  
This Elbow has no crimps, cavities or angles, which cause accumulations that rust or corrode the iron, and it is also easily polished and kept clean.  
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**THE AMERICAN WIRE NAIL CO.,**  
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Molding, Trimming, Upholstering & Finishing Nails, Escutcheon Pins and Wire Nails  
Of all kinds and sizes, with Flat, Oval, Depressed, or Countersunk Heads, with or without points. Warranted Well Made and of Superior Quality.  
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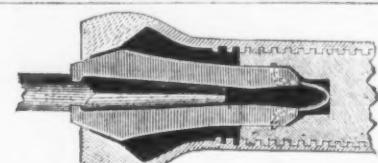
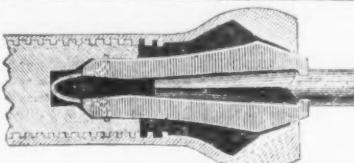
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**WM. J. NICOLLS,**  
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**RAILROAD SUPPLIES**  
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This Cut Represents the Jaws of the Barber Bit Brace.

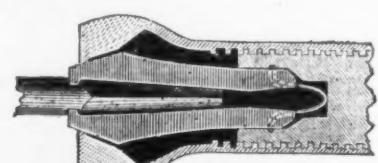
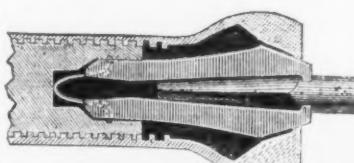
The United States Court recently decided that the Millers Falls Company has the exclusive right to make this style of Brace Jaws, and a higher court long ago decided that they are the only jaws which will hold tools of any size or shape.

All of our Brace Jaws are now made of forged steel, and are nearly indestructible, which is true of no other brace.

We shall make our goods perfect in every respect, and sell them at reasonable prices without trying to compete with inferior goods. We think in the end this will be for the interest of both manufacturers and dealers.

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**HOWARD PARALLEL BENCH VISE.**  
MANUFACTURED BY  
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furnishes an abundant supply of pure, moist heat, easily regulated to any desired temperature.

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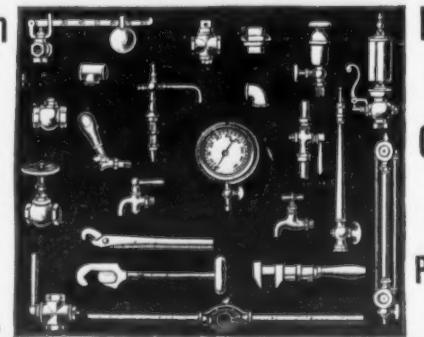
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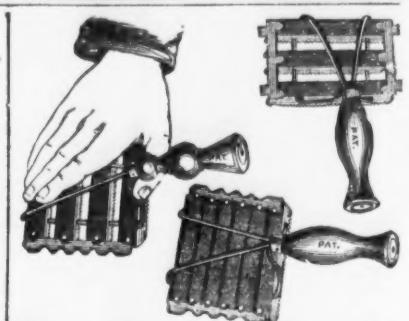
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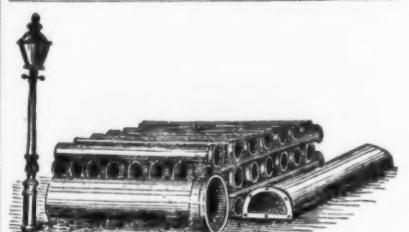


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Are now prepared to sell, to approved parties,  
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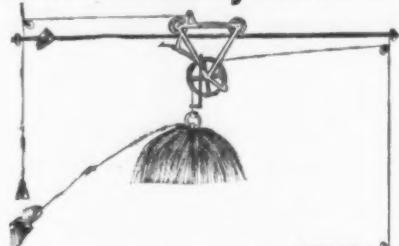
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WORKS at Broad Ford, Pa.  
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The goods are sold by all leading jobbers in  
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Signs, Door, Number and Finger plates enameled in  
any color and decorated in any style.  
Illustrated circular and price list on application.  
For Furniture, Makers, and every description of Wrought  
and Cast Iron Work enameled to order.

## CUMBERLAND FIRE BRICK WORKS

Gardner, Stuart & Co.,  
Manufacturers of  
STANDARD SAVAGE FIRE BRICK.  
OFFICE: Room 3, No. 96½ Fourth Ave.,  
PITTSBURGH, PA.

WORKS: One mile from Mt. Savage Junction,  
Md., B. & O. R. R.

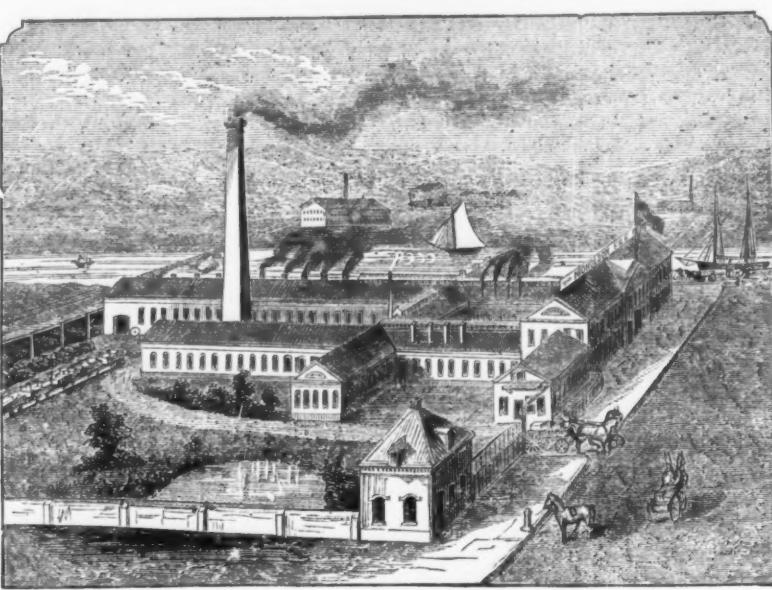
Illustrated Circulars and Price Lists on application.

THOS. D. STETSON,  
No. 23 Murray St., N. Y.  
Solicitor of Patents, and  
Scientific Expert in  
patent cases. Send for circular.

PATENTS.

## TROY FIRE BRICK WORKS,

Jas. Ostrander & Son,  
Established 1848.  
Manufacturers of  
FIRE BRICK,  
Tuyeres, Tiles, Blast Furnace Blocks, etc.  
Miners and Dealers in  
Woodbridge Fire Clay and Sand,  
and Staten Island Kaolin.  
Price List, Diagrams of Fire Brick,  
and all other information cheerfully  
furnished on application.

TROY, N. Y.  
JAMES OSTRANDER,  
FRANCIS A. OSTRANDER, Surviving  
partner.

## DEALERS AND CONSUMERS

## OF FILES

SHOULD PURCHASE THE

## Nicholson or "Increment Cut" File

## FOR THE FOLLOWING REASONS:

First.—They are made from the best quality of File Steel.  
Second.—Each File undergoes a careful inspection after each operation, by critical inspectors, and none but perfect work allowed to pass.

Third.—They are cut by the "Increment" or irregular cut, therefore combine the advantages of both Hand and Machine work.

Fourth.—They will finish finer than Files of any other make of same degree of coarseness.

Fifth.—They will not "pin" or scratch like hand-cut Files.

Sixth.—The "Increment cut" File, by our records, will remove more stock with a given number of pounds applied than any other File with which we are acquainted.

Seventh.—All Files under seven inches are put up in boxes of one dozen each, and neatly labeled.

Eighth.—The large stock carried by us, combined with our superior facilities, enables us to fill the largest orders at the shortest possible notice.

Ninth.—We are constantly making careful tests of our Files by delicately constructed machinery, which automatically records the actual power applied, forward, backward and downward, at each stroke of the File, also the number of strokes, combined with the work performed, enables us not only to judge of the quality of our Steel for wear, but also of the cutting qualities of the File, and the ease (expressed in pounds) with which a given amount of work can be accomplished.

Finally.—Our Files are warranted to be hard, well cut and sound. They are exclusively used by many of the largest Railroads and Machinists in the country—and the vigorous growth of our reputation, not only for making a good article, but of our ability to furnish a good article cheap, is evidenced by the large number of Dealers and Jobbers who are handling our Files exclusively.

NICHOLSON FILE COMPANY, Providence, R. I.

SOLD BY HARDWARE DEALERS GENERALLY.

## Lester Oil Co.,

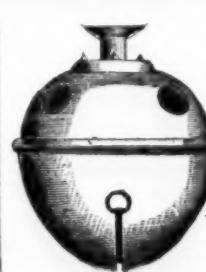
81 MAIDEN LANE, N. Y.

Exclusive manufacturers of the Renowned

Synovial Lubricating  
OILS.

The most Durable, Reliable & Economic Lubricant in existence;  
Applicable to every grade of machinery. Send for Circular and Price List.

## SUPPLIES

FOR  
Railways, Machinists and Amateurs,  
Gum and Leather Belting, Packings and Cotton  
Waste, Babbit Metal.FINE TOOLS  
for Machinists and Amateurs; Barnes' Foot Power  
Scroll Saw; Foot Lathes all kinds; Sole Agents  
Baxter Steam Engine, Iron and Wood Working  
Machinery. Send for Price Lists.JACKSON & TYLER,  
16 German St., Baltimore, Md.

## NEWTON &amp; CO.,

Successors to  
PALMER, NEWTON & CO.,  
ALBANY, N. Y., Manufacturers

## FIRE BRICK

## Stove Linings,

## Range and Heater Linings

Cylinder Brick, &amp;c., &amp;c.

## B. KREISCHER &amp; SON.,

## New York Fire Brick &amp;

CLAY RETORT WORKS,

Established 1845.

Office, foot of Houston Street, East River,  
NEW YORK.The largest stock of Fire Brick of all shapes and  
sizes on hand, and made to order at short notice.Cupola Brick, for McKenzie Patent,  
and others. Fire Mortar, Ground Brick, Clay and  
Sand. Superior Kaolin for Rolling Mills and Foundries.  
Stone Ware and other Fire Clay and Sand,  
from my own mines at New Jersey and Staten Island,  
by the cargo or otherwise.

## Watson Fire Brick Manufactory

ESTABLISHED 1836.

JOHN R. WATSON, Perth Amboy, New Jersey.  
Manufacturer of

## FIRE BRICK,

For Rolling Mills, Blast Furnaces, Foundries,  
Gas Works, Lime Kilns, Tanneries, Boiler  
and Gear Setting, Glass Works, &c.

FIRE CLAY, FIRE SAND, AND KAOLIN FOR SALE.

## A. HALL &amp; SONS, Perth Amboy, N. J.

ESTABLISHED 1846.

## HALL &amp; SONS, Buffalo, N. Y.

ESTABLISHED 1866.

## FIRE BRICK

of reliable quality for all purposes, manufactured of the  
best New Jersey Fire Clays. Also, ROCKINGHAM  
WARE, YELLOW WARE, Fire Clay, Fire Sand, Kaolin  
Ground Fire Brick, and Diamantine Building Brick.

## MANHATTAN FIRE BRICK

and Enamelled Clay Retort Works.

ADAM WEBER, Proprietor.  
Office, 633 to 635 15th St., N. Y. Clay Retorts, Examined  
for Gas Houses; Retorts for burning bone and  
re-burning bone for Bone Black, Fire Bricks, Fire  
Blocks, Cupola and Range Bricks of all shapes and sizes.  
The best fire clay from my own Clay Beds at Perth  
Amboy, N. J.

## HENRY MAURER,

Proprietor of the

Excelsior Fire Brick & Clay  
Retort Works,Manufacturers of FIRE BRICK, HOLLOW  
BRICK AND CLAY RETORTS.

WORKS: PERTH AMBOY, NEW JERSEY.

Office &amp; Depot: 418 to 422 East 23d St., N. Y.

## BROOKLYN CLAY RETORT

AND

## Fire-Brick Works,

No. 88 Van Dyke Street, Brooklyn, N. Y.

Edward D. White, surviving Partner of the late firm  
of J. K. Brick & Co.

## M. D. Valentine &amp; Bro

Manufacturers of

FIRE BRICK  
And Furnace Blocks

DRAIN PIPE &amp; LAND TILE.

Woodbridge, - - - N. J.

## Troy Polishing Works.

STOVE ORNAMENTS

A Specialty.

No. 7 Sixth Street, TROY, N. Y.

THOS. A. ELGIE, Agent.

## Go to BRASS GOODS MFG. CO.,

280 Pearl Street, N. Y., for

Manufacturing Business  
Silver Trade Boxes  
Printed Back Mirror  
Gold Twenty Dollar  
Gold Back Mirror  
Useful beside beingAlso all kinds of Press or Die work done cheaply,  
satisfactorily, promptly and well.

## CARDS

Manufactured by

Cranes Bros. Mfg. Co.

CHICAGO.

COOKE &amp; BEGGS, Agts.

16 Cortlandt St., N. Y.

## PATENTS.

F. A. LEHMANN, Solicitor of Patents, Washington,  
D. C. No Patent, No Pay. Send for circular.

## HOWSONS'

OFFICES FOR PRACTICING

## PATENTS,

Forrest Buildings,

119 SOUTH FOURTH ST., PHILADELPHIA

AND MARBLE BUILDINGS

605 SEVENTH ST. (Opposite U. S. Patent Office,  
Washington, D. C.)H. HOWSON, Solicitor of Patents. C. HOWSON,  
Attorney at Law.

Communications should be addressed to the

PRINCIPAL OFFICES, PHILADELPHIA.

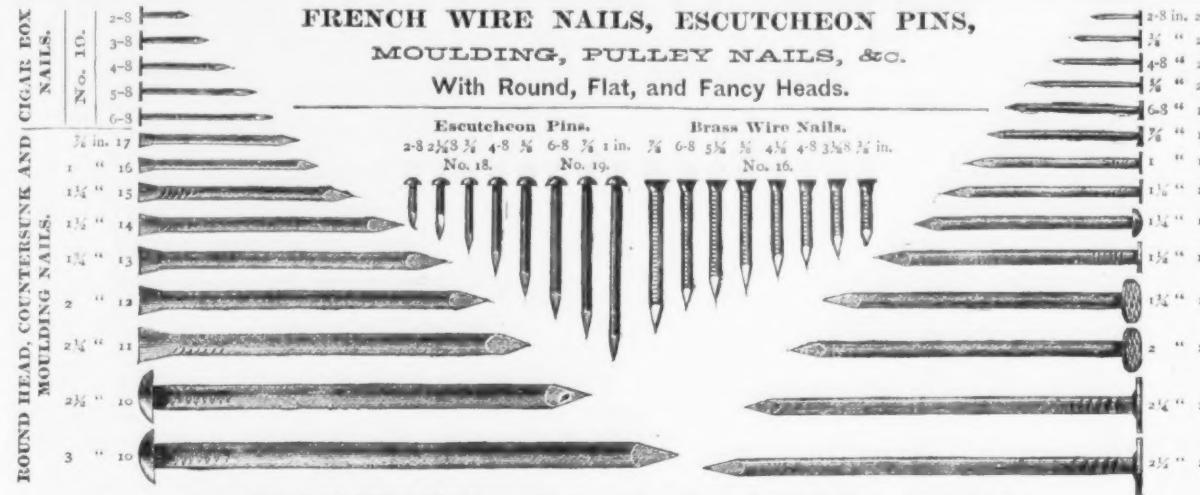
# HOBART'S TACKS

MANUFACTURED BY

DUNBAR, HOBART &amp; WHIDDEN,

ESTABLISHED 1810.

Office and Salesroom, 116 Chambers Street, New York. - - - Factory, South Abington, Mass.



Any Kind of Wire Nails made to order from Description, or Samples.

## American and Swedes Iron Tacks,

Tinned, Leathered and Large Head Carpet Tacks, Finishing Nails, Black and Tinned Trunk Nails, Miners' Copper, Gimp, Lace and Brush Tacks, Hungarian, Chair, Cigar Box and Barrel Nails, Glaziers' Points, Iron, Steel, Copper and Zinc Shoe Nails, Patent Improved Brass Shoe Nails, Heel and Toe Plates, Steel Shanks, and Fancy Head Nails, Silver or Japanned Lining and Saddle Nails, A full assortment always on hand at salesrooms, for immediate delivery if required. Odd and Irregular Sizes made to order or cut from sample at short notice. **Send for Price List.**

## IRON-BOUND FRENCH BOOT POLISH.

### Extra Quantity and Quality.

RETAILS AT 15 CENTS.

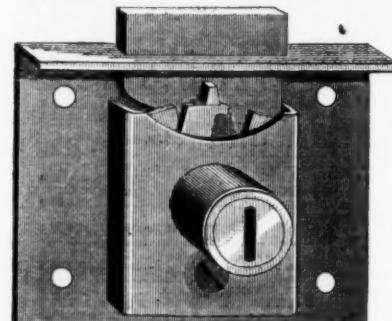
Price Per Gross \$12. Discounts to Jobbers only.



MANUFACTURED ONLY BY

THE SPRAGUE NOVELTY WORKS, Rochester, N. Y.

W. M. ERNST, Sales Agent, 26 Cliff Street, New York.



A NEW  
Drawer Lock.  
THE  
"STANDARD."

Applicable also to Cupboards, etc.  
Made wholly of Brass, and finely finished. Each Lock has two flat, steel, nickel-plated Keys.  
Dealers desiring to examine this Lock will receive a sample without charge, by addressing

The Yale Lock Mfg. Co.  
STAMFORD, CONN.

List Price, - - \$8.50 per dozen.

The Famous Improved  
**SHEPARDSON LOCKS**

Are the "Best" in the World.

The United States Lock Co.,

Office and Manufactory, KINGSTON, MASS.

W. M. F. DONOVAN, General Manager.  
NEW YORK OFFICE, 97 Chambers Street.

## TO MANUFACTURERS & DEALERS IN SKATES.

### CAUTION.

A re-issue of letters patent Aug. 18, 1874, No. 154,176, re-issued May 4, 1875, No. 16,410, re-issued Feb. 20, 1877, No. 17,524, application filed Nov. 14, 1876, having been granted to Oliver Edwards, all manufacturers and dealers are notified that they must cease making or selling any skates infringing the same. Special attention is invited to claim 8, "a skate-runner having its bottom constructed with a laterally projecting rib and its standards provided with plate supporting brackets, all made in a single piece of metal, substantially as and for the purpose described."

Nearly every cheap, all-metal skate in the market infringes this claim. Manufactured only by the

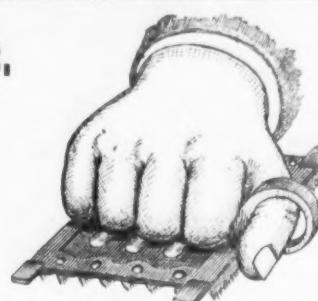
FLORENCE MACHINE CO., Florence, Mass.

### FAC-SIMILES



Centennial Award Medal  
Executed on Glass "en Relief," for outside show, from  
5 to 24 in. diameter, by the  
Otto Stietz N. Y. Glass Letter Co.,  
611 Broadway.  
Advertising Glass Signs a specialty.

## Hotchkiss' Novelty Combs.



We ask the attention of the public to our Patent Novelty Curry Combs, represented above, which are universally acknowledged to be far superior to anything in the market, being neat and durable and the most convenient to handle of any Comb yet produced. They are put up in paper boxes of one dozen each, and packed 24 dozen in a case. *Give them a trial.*

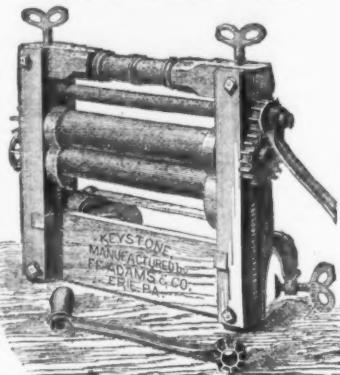
For sale by the jobbing Hardware, Saddlery and Woodenware trade.

HOTCHKISS' SONS, Bridgeport, Conn.

Office and Warehouses, 113 Chambers Street, New York.

## KEYSTONE WRINGERS.

No. 2 1-2 Purchase Gear.



Protection in Sale Guaranteed.

Other Household Goods for Home and Export Trade.

F. F. ADAMS &amp; CO.

ERIE, PA.

CHAS. D. & W. S. GRAHAM,  
No. 88 Wall Street, New York,  
AGENTS.

## Harvey W. Peace, Vulcan Saw Works.

Manufacturer of every kind of

Patent Ground



SAWS.

Union Avenue, Tenth and Ainslie Streets, BROOKLYN, E. D., N. Y.

E. M. BOYNTON,

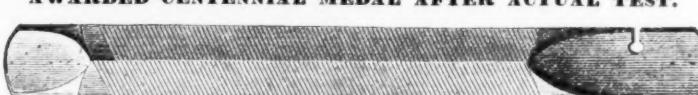
Manufacturer of all kinds of

First-Class Saws, Saw Frames, Cross-Cut Handles, Tools, Files, &amp;c. Also Sole Proprietor and Mfr. of the Genuine Patent Lightning Saw,

No. 50 Beekman Street, NEW YORK.

Special attention is called to my new Centennial Saw, patented March 28th, 1876; Special File and Saw-Set combined, patented June 20th, 1876; Cross Cut (Loop) Saw Handle, patented February 15th, 1876; New One-Man Saw, with Patent Double Removable Handle Attachment, March 12th, 1876; New Patent Circular Clearer Tooth, patented August 15th, 1876; Saw Set, patented Nov. 26th, 1873—a perfect Set that a blind man can use to condense like a Hammer Set perfectly; Cross-Bar Wood Saw Frame, patented Nov. 12, 1872; also Cross-Cut Handle, with castings, patented Feb. 15, 1870. These goods complete the scientific tools for cutting timber, instead of wearing it off with notched **V** teeth (which are like a fractured plate sharpened).

AWARDED CENTENNIAL MEDAL AFTER ACTUAL TEST.



PHILADELPHIA, November 11th, 1876.

REPORT ON AWARDS. GROUP No. 15.

Product: Saws in great variety; special improvement in shape of teeth, called Patent Lightning Saw. Name and Address of Exhibitor: Eben Moody Boynton, New York.

The undersigned having examined the product herein described, respectfully recommends the same to the United States Centennial Commission for award, for the following reasons, viz:

Report: "Being of very Superior Quality and of great Practical Utility." DANIEL STEINMETZ, Signature of the Judge.

J. D. IMBODEN, of Virginia, CHARLES STAPLES, of Maine, G. L. REED, of Penn., JUDGES.

J. DIFENBACH, of Germany, DAVID McHARDY, of Scotland, D. STEINMETZ, of Phila.

A true copy of the record. FRANCIS A. WALKER, Chief of the Bureau of Awards.

Given by authority of the U. S. Centennial Commission. J. L. CAMPBELL, Sec'y. A. T. GOSHORN, Director General. J. R. HAWLEY, Pres't.

E. C. ATKINS, ESTABLISHED 1857. H. KNIPPENBERG.

E. C. ATKINS &amp; CO., Indianapolis, Ind., Saw Manufacturers and Repairers.

Sole manufacturers of the celebrated GENUINE SILVER STEEL DIAMOND X CUT SAW.

\$1.50 Per Foot.



BEWARE OF THE IMITATION CALLED "DIAMOND TOOTH."

## Wheeler, Madden & Clemson MFG. CO.,

MIDDLETOWN, - - - NEW YORK.

Manufacturers of

WARRANTED CAST STEEL

## SAWS

Of every description, including

Circular, Shingle, Cross-Cut, Mill, Hand, WOOD SAWS. Etc., Etc.

## AMERICAN SAW CO.,

Manufacturers of

Movable Toothed Circular Saws,

PERFORATED CROSS-CUT SAWS

And SOLID SAWS of all kinds.

Trenton, N. J.

# New York Wholesale Prices, July 11, 1877.

## HARDWARE.

|   |                               |   |                               |
|---|-------------------------------|---|-------------------------------|
| Boston Flush, with Iron Acorns.....                 | dis 73 & 10                   | Wellington Mills, Grain.....  | ...P P 10c. net               |
| " " " with Sil'd Wrought Iron.....                  | dis 65 & 10                   | Flour.....  | ...P P 8c. net                |
| Fast Joint, Narrow.....                             | dis 40 & 10                   | <b>Enameled and Tinned Ware.</b>  |                               |
| " " " Iron.....                                     | dis 30 & 10                   | Kettles.....  | dis 30 & 50                   |
| Loose Joint, Broad.....                             | dis 40 & 10                   | Sauce Pans.....   | dis 30 & 50                   |
| Table Buits, Back Flaps, &c.....                    | dis 35 & 10                   | Glue Kettles.....   | dis 30 & 50                   |
| Inside Buit, Regular.....                           | dis 40 & 10                   | Glue Saucepans.....   | dis 30 & 50                   |
| " " " Light.....                                    | dis 30 & 10                   | <b>Brackets.</b>  |                               |
| Loose Pin, Writ.....                                | dis 30 & 10                   | Door Lock.....  | Same discounts as Door Lock   |
| Am. Spiral Spring Buit Co., Japaned, Fancy.....     | dis 35 & 10                   | Brass Thread.....   | dis 60c & 10c                 |
| Sabin Mfg. Co., Double Acting.....                  | dis 35 & 10                   | Wood.....   | dis 25                        |
| Union Spring Hinge Co.....                          | dis 25                        | <b>Flutes.</b>  |                               |
| Union Mfg. Co., Spring Hinges.....                  | dis 25                        | American File Co.....   | ...\$5.00 to 1 currency       |
| Blind Buit, Parker.....                             | dis 30 & 10                   | Arade de File Works.....  | ...\$5.00 to 1 currency       |
| " " " Fairmer.....                                  | dis 40 & 10                   | " " ".....  | ...\$5.00 to 1 currency       |
| " " " Seymour.....                                  | dis 60 & 10                   | Wood and Metallic.....  | dis 25 & 10                   |
| " " " Shepard.....                                  | dis 60 & 10                   | Wood, Cork Lined.....   | dis 65c & 10c                 |
| " " " Lur & Porter.....                             | dis 60 & 10                   | Enterprise Mfg. Co., Self-Measuring.....  | dis 20                        |
| " " " Nicholson.....                                | dis 60 & 10                   | <b>File Plates.</b>   |                               |
| " " " Huffer.....                                   | dis 60 & 10                   | American File Co.....   | ...\$5.00 to 1 currency       |
| " " " Garrison.....                                 | dis 10 & 10                   | Arade de File Works.....  | ...\$5.00 to 1 currency       |
| " " " Clark's, Nos. 1, 2, 3, 4, 5, 6, 7, 8, 10..... | dis 60 & 10                   | " " ".....  | ...\$5.00 to 1 currency       |
| " " " Nos. 2 4, 5, 6, 8, 10.....                    | dis 50 & 10                   | McGill's.....   | ...\$5.00 per doz per doz net |
| " " " Sargent's.....                                | dis 70 & 10                   | <b>Files.</b>   |                               |
| Messenger's Comet.....                              | per doz \$300                 | American File Co.....   | ...\$5.00 to 1 currency       |
| American.....                                       | per doz 225                   | Arade de File Works.....  | ...\$5.00 to 1 currency       |
| Lyman's.....  | per doz 275                   | " " ".....  | ...\$5.00 to 1 currency       |
| No. 4. French.....                                  | per doz 225                   | Wood and Metallic.....  | dis 25 & 10                   |
| No. 5. Iron Hande.....                              | per doz 225                   | Wood, Cork Lined.....   | dis 65c & 10c                 |
| Sprague's.....                                      | ... Nos. 2 3                  | Enterprise Mfg. Co., Self-Measuring.....  | dis 20                        |
| Per doz \$200                                       | 225                           | <b>Flute Plates.</b>  |                               |
| Eureka.....   | ... per doz \$200             | American File Co.....   | ...\$5.00 to 1 currency       |
| Sardine Scissors.....                               | per doz \$7.00                | Arade de File Works.....  | ...\$5.00 to 1 currency       |
| Caps & Goldmarks, per 1000.....                     | G. D. & S. 35 & 10            | " " ".....  | ...\$5.00 to 1 currency       |
| " " " 1-10 Ground.....                              | ... G. D. & S. 5              | Wood and Metallic.....  | dis 25 & 10                   |
| " " " 1-10 Turned.....                              | ... G. D. & S. 5              | Wood, Cork Lined.....   | dis 65c & 10c                 |
| D. W. P. 1-10.....                                  | ... G. D. & S. 5              | Enterprise Mfg. Co., Self-Measuring.....  | dis 20                        |
| D. W. P. 1/2.....                                   | ... G. D. & S. 5              | <b>Flutes.</b>  |                               |
| Colt's 1-10.....                                    | ... G. D. & S. 5              | American File Co.....   | ...\$5.00 to 1 currency       |
| Ely's E. B. 1-48, Sec. 1-10, 70c gold               | ... 1-48, Sec. 1-10, 70c gold | Arade de File Works.....  | ...\$5.00 to 1 currency       |
| Double, Waterproof, 1-48, \$130; 1-10, 10c gold     | ... 1-48, Sec. 1-10, 10c gold | " " ".....  | ...\$5.00 to 1 currency       |
| <b>Carpet Sweepers.</b>                             |                               | Wood and Metallic.....  | dis 25 & 10                   |
| Welcome.....  | each \$2.75 net               | Wood, Cork Lined.....   | dis 65c & 10c                 |
| <b>Cartridges.—Metallic.</b>                        |                               | Enterprise Mfg. Co., Self-Measuring.....  | dis 20                        |
| <b>Carrus.—Horse and Curry.</b>                     |                               | <b>Flute Plates.</b>  |                               |
| Cotton.....   | dis 30c & 10                  | American File Co.....   | ...\$5.00 to 1 currency       |
| Wool.....   | dis 15c & 10                  | Arade de File Works.....  | ...\$5.00 to 1 currency       |
| <b>Carpet Stretchers.</b>                           |                               | " " ".....  | ...\$5.00 to 1 currency       |
| Cast Steel, Polished.....                           | per doz \$5.00                | Wood and Metallic.....  | dis 25 & 10                   |
| Cast Iron, Steel Points.....                        | per doz \$2.00                | Wood, Cork Lined.....   | dis 65c & 10c                 |
| <b>Cutters.</b>                                     |                               | Enterprise Mfg. Co., Self-Measuring.....  | dis 20                        |
| Bed.....  | dis 55                        | <b>Flutes.</b>  |                               |
| Plate and Shallow Socket.....                       | dis 55                        | American File Co.....   | ...\$5.00 to 1 currency       |
| Deep Socket.....                                    | dis 40                        | Arade de File Works.....  | ...\$5.00 to 1 currency       |
| <b>Cattle Leaders.</b>                              |                               | " " ".....  | ...\$5.00 to 1 currency       |
| Hotchkiss' Sons.....                                | ... net                       | Wood and Metallic.....  | dis 25 & 10                   |
| Humason, Beckley & Co.'s.....                       | dis 60c & 10                  | Wood, Cork Lined.....   | dis 65c & 10c                 |
| Union Nut Co.....                                   | dis 60c & 10                  | Enterprise Mfg. Co., Self-Measuring.....  | dis 20                        |
| <b>Chains.</b>                                      |                               | <b>Flute Plates.</b>  |                               |
| Eugus Coll.....                                     | ... net                       | American File Co.....   | ...\$5.00 to 1 currency       |
| " " " 84 5c 25% 75 75 75 75 75 75 75 75 75          | Arade de File Works.....      | ...\$5.00 to 1 currency   |                               |
| Trace, 64-10-2.....                                 | ... by the cask               | " " ".....  | ...\$5.00 to 1 currency       |
| Trace, 7-10-2.....                                  | ... by the cask               | Wood and Metallic.....  | dis 25 & 10                   |
| German Halter Chain.....                            | ... dis 60c                   | Wood, Cork Lined.....   | dis 65c & 10c                 |
| German Coll.....                                    | ... dis 60c & 10              | Enterprise Mfg. Co., Self-Measuring.....  | dis 20                        |
| Galvanized Pump Chain.....                          | ... 10c                       | <b>Flutes.</b>  |                               |
| Jack Chain Iron.....                                | ... dis 10                    | American File Co.....   | ...\$5.00 to 1 currency       |
| " " " Brass.....                                    | ... dis 10                    | Arade de File Works.....  | ...\$5.00 to 1 currency       |
| <b>Chalk.</b>                                       |                               | " " ".....  | ...\$5.00 to 1 currency       |
| White.....  | ... gross, 55c net            | Wood and Metallic.....  | dis 25 & 10                   |
| Red.....  | ... gross, 75c net            | Wood, Cork Lined.....   | dis 65c & 10c                 |
| Blue.....   | ... gross, 90c net            | Enterprise Mfg. Co., Self-Measuring.....  | dis 20                        |
| White Crayons.....                                  | ... gross, 14c net            | <b>Fluting Scissors.</b>  |                               |
| <b>Chisels.</b>                                     |                               | Burden.....   |                               |
| D. R. Barton Tool Co. (all kinds).....              | dis 20                        | R. I. Horse Shoe Co., Perkins' Improved Light, Med. and Heavy.....  | ... kg. \$924                 |
| Socket Framing.....                                 | dis 60c & 10                  | Perkins' Snow.....  | ... kg. 3924                  |
| Crossman.....                                       | dis 60c & 10                  | The Boston Horse Shoe Co., Building in Hand Made, Ice Ax, Hives, &c. etc. etc.  | ... kg. 50                    |
| Buck Bros.....                                      | new list dis 175              | American Ice Ctel.....  | per doz \$6.50 net            |
| Hart Mfg. Co. No. 1.....                            | dis 60c & 10                  | National, Pointed and Polished, Pat. Fin. & Pointed and Polished, Ex. Fin. & Pointed and Polished, Ptd & Pld.....   | per doz \$6.50, dis 10        |
| Merrill.....  | dis 60c & 10                  | Cortland, Buffalo Forged, Globe, Ptd & Pld.....   | per doz \$6.50, dis 10        |
| Witherby Tool Co.....                               | dis 60c & 10                  | National, Pointed and Polished, Pat. Fin. & Pointed and Polished, Ex. Fin. & Pointed and Polished, Ptd & Pld.....   | per doz \$6.50, dis 10        |
| Socket Corner.....                                  | dis 40                        | Eagle, 5/8-inch Roll.....   | ... \$18.00 per doz net       |
| Tanged Firmers, extra.....                          | dis 40                        | Eagle, 7/8".....  | 24.00 per doz net             |
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77-in. 815c; 78-in. 825c; 79-in. 835c; 80-in. 845c; 81-in. 855c; 82-in. 865c; 83-in. 875c; 84-in. 885c; 85-in. 895c; 86-in. 905c; 87-in. 915c; 88-in. 925c; 89-in. 935c; 90-in. 945c; 91-in. 955c; 92-in. 965c; 93-in. 975c; 94-in. 985c; 95-in. 995c; 96-in. 1005c; 97-in. 1015c; 98-in. 1025c; 99-in. 1035c; 100-in. 1045c; 101-in. 1055c; 102-in. 1065c; 103-in. 1075c; 104-in. 1085c; 105-in. 1095c; 106-in. 1105c; 107-in. 1115c; 108-in. 1125c; 109-in. 1135c; 110-in. 1145c; 111-in. 1155c; 112-in. 1165c; 113-in. 1175c; 114-in. 1185c; 115-in. 1195c; 116-in. 1205c; 117-in. 1215c; 118-in. 1225c; 119-in. 1235c; 120-in. 1245c; 121-in. 1255c; 122-in. 1265c; 123-in. 1275c; 124-in. 1285c; 125-in. 1295c; 126-in. 1305c; 127-in. 1315c; 128-in. 1325c; 129-in. 1335c; 130-in. 1345c; 131-in. 1355c; 132-in. 1365c; 133-in. 1375c; 134-in. 1385c; 135-in. 1395c; 136-in. 1405c; 137-in. 1415c; 138-in. 1425c; 139-in. 1435c; 140-in. 1445c; 141-in. 1455c; 142-in. 1465c; 143-in. 1475c; 144-in. 1485c; 145-in. 1495c; 146-in. 1505c; 147-in. 1515c; 148-in. 1525c; 149-in. 1535c; 150-in. 1545c; 151-in. 1555c; 152-in. 1565c; 153-in. 1575c; 154-in. 1585c; 155-in. 1595c; 156-in. 1605c; 157-in. 1615c; 158-in. 1625c; 159-in. 1635c; 160-in. 1645c; 161-in. 1655c; 162-in. 1665c; 163-in. 1675c; 164-in. 1685c; 165-in. 1695c; 166-in. 1705c; 167-in. 1715c; 168-in. 1725c; 169-in. 1735c; 170-in. 1745c; 171-in. 1755c; 172-in. 1765c; 173-in. 1775c; 174-in. 1785c; 175-in. 1825c; 176-in. 1835c; 177-in. 1845c; 178-in. 1855c; 179-in. 1865c; 180-in. 1875c; 181-in. 1885c; 182-in. 1895c; 183-in. 1905c; 184-in. 1915c; 185-in. 1925c; 186-in. 1935c; 187-in. 1945c; 188-in. 1955c; 189-in. 1965c; 190-in. 1975c; 191-in. 1985c; 192-in. 1995c; 193-in. 2005c; 194-in. 2015c; 195-in. 2025c; 196-in. 2035c; 197-in. 2045c; 198-in. 2055c; 199-in. 2065c; 200-in. 2075c; 201-in. 2085c; 202-in. 2095c; 203-in. 2105c; 204-in. 2115c; 205-in. 2125c; 206-in. 2135c; 207-in. 2145c; 208-in. 2155c; 209-in. 2165c; 210-in. 2175c; 211-in. 2185c; 212-in. 2195c; 213-in. 2205c; 214-in. 2215c; 215-in. 2225c; 216-in. 2235c; 217-in. 2245c; 218-in. 2255c; 219-in. 2265c; 220-in. 2275c; 221-in. 2285c; 222-in. 2295c; 223-in. 2305c; 224-in. 2315c; 225-in. 2325c; 226-in. 2335c; 227-in. 2345c; 228-in. 2355c; 229-in. 2365c; 230-in. 2375c; 231-in. 2385c; 232-in. 2395c; 233-in. 2405c; 234-in. 2415c; 235-in. 2425c; 236-in. 2435c; 237-in. 2445c; 238-in. 2455c; 239-in. 2465c; 240-in. 2475c; 241-in. 2485c; 242-in. 2495c; 243-in. 2505c; 244-in. 2515c; 245-in. 2525c; 246-in. 2535c; 247-in. 2545c; 248-in. 2555c; 249-in. 2565c; 250-in. 2575c; 251-in. 2585c; 252-in. 2595c; 253-in. 2605c; 254-in. 2615c; 255-in. 2625c; 256-in. 2635c; 257-in. 2645c; 258-in. 2655c; 259-in. 2665c; 260-in. 2675c; 261-in. 2685c; 262-in. 2695c; 263-in. 2705c; 264-in. 2715c; 265-in. 2725c; 266-in. 2735c; 267-in. 2745c; 268-in. 2755c; 269-in. 2765c; 270-in. 2775c; 271-in. 2785c; 272-in. 2795c; 273-in. 2805c; 274-in. 2815c; 275-in. 2825c; 276-in. 2835c; 277-in. 2845c; 278-in. 2855c; 279-in. 2865c; 280-in. 2875c; 281-in. 2885c; 282-in. 2895c; 283-in. 2905c; 284-in. 2915c; 285-in. 2925c; 286-in. 2935c; 287-in. 2945c; 288-in. 2955c; 289-in. 2965c; 290-in. 2975c; 291-in. 2985c; 292-in. 2995c; 293-in. 3005c; 294-in. 3015c; 295-in. 3025c; 296-in. 3035c; 297-in. 3045c; 298-in. 3055c; 299-in. 3065c; 300-in. 3075c; 301-in. 3085c; 302-in. 3095c; 303-in. 3105c; 304-in. 3115c; 305-in. 3125c; 306-in. 3135c; 307-in. 3145c; 308-in. 3155c; 309-in. 3165c; 310-in. 3175c; 311-in. 3185c; 312-in. 3195c; 313-in. 3205c; 314-in. 3215c; 315-in. 3225c; 316-in. 3235c; 317-in. 3245c; 318-in. 3255c; 319-in. 3265c; 320-in. 3275c; 321-in. 3285c; 322-in. 3295c; 323-in. 3305c; 324-in. 3315c; 325-in. 3325c; 326-in. 3335c; 327-in. 3345c; 328-in. 3355c; 329-in. 3365c; 330-in. 3375c; 331-in. 3385c; 332-in. 3395c; 333-in. 3405c; 334-in. 3415c; 335-in. 3425c; 336-in. 3435c; 337-in. 3445c; 338-in. 3455c; 339-in. 3465c; 340-in. 3475c; 341-in. 3485c; 342-in. 3495c; 343-in. 3505c; 344-in. 3515c; 345-in. 3525c; 346-in. 3535c; 347-in. 3545c; 348-in. 3555c; 349-in. 3565c; 350-in. 3575c; 351-in. 3585c; 352-in. 3595c; 353-in. 3605c; 354-in. 3615c; 355-in. 3625c; 356-in. 3635c; 357-in. 3645c; 358-in. 3655c; 359-in. 3665c; 360-in. 3675c; 361-in. 3685c; 362-in. 3695c; 363-in. 3705c; 364-in. 3715c; 365-in. 3725c; 366-in. 3735c; 367-in. 3745c; 368-in. 3755c; 369-in. 3765c; 370-in. 3775c; 371-in. 3785c; 372-in. 3795c; 373-in. 3805c; 374-in. 3815c; 375-in. 3825c; 376-in. 3835c; 377-in. 3845c; 378-in. 3855c; 379-in. 3865c; 380-in. 3875c; 381-in. 3885c; 382-in. 3895c; 383-in. 3905c; 384-in. 3915c; 385-in. 3925c; 386-in. 3935c; 387-in. 3945c; 388-in. 3955c; 389-in. 3965c; 390-in. 3975c; 391-in. 3985c; 392-in. 3995c; 393-in. 4005c; 394-in. 4015c; 395-in. 4025c; 396-in. 4035c; 397-in. 4045c; 398-in. 4055c; 399-in. 4065c; 400-in. 4075c; 401-in. 4085c; 402-in. 4095c; 403-in. 4105c; 404-in. 4115c; 405-in. 4125c; 406-in. 4135c; 407-in. 4145c; 408-in. 4155c; 409-in. 4165c; 410-in. 4175c; 411-in. 4185c; 412-in. 4195c; 413-in. 4205c; 414-in. 4215c; 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POWELTON

SEMI-BITUMINOUS

COALS.

THE BEST & CHEAPEST

In the market for the use of Ocean Steamers, Tug-

Boats and Locomotives, Stationary

Engines, Steel Makers, Rolling Mills,

Puddlers, Glass

Manufacturers,

Blacksmithing, Brick and Lime Burning, and Gen-

eral Industrial Purposes.

These coals can be forwarded to all points reached

by railroad or navigation.

Lehigh Valley Coal Co.,

MINERS AND SHIPPERS OF

Lehigh, Wyoming White & Red Ash

(BALTIMORE VEIN.)

Office, Cor. Cortlandt & Church Sts.

George B. Newton, Agent. Ships direct from the mines, and from

Perth Amboy and Jersey City, for all points.

THE HOBOKEN COAL CO.,

Dealers in

SCRANTON, LEHIGH and other COALS.

Retail Yard on D. L. & W. Railroad, cor. Grove and

19th Streets, Hoboken, N. J. Cor. Cortlandt and Church Streets.

Freight Cars and Trunks, Freight Rates.

Office, At Yard cor. Grove and 19th Sts.; cor. Bay

St. and Newark Ave., Jersey City. Room 35, 111 Broad-

way, New Jersey. Office, 10th St. and Broad St., Hoboken.

## WHEELING HINGE CO., Wheeling, West Va.,

Manufacturers of

Wrought Butts, Strap & T Hinges, Wrought Hooks,  
Hasps & Staples, Wrought Repair  
Links & Washers,

GRAHAM &amp; HAINES, Sole Agents, 113 Chambers &amp; 95 Reade Sts., N. Y.

## QUACKENBUSH, TOWNSEND & CO., Hardware, Cutlery, &c.

85 Chambers &amp; 67 Reade Sts., N. Y.

Depot for  
THOS JOWITT & SONS,  
(Sheffield, England.)  
FILES and HORSE RASPS.  
Rough & Ready  
And  
CLIPPER SCYTHES,  
Warranted.



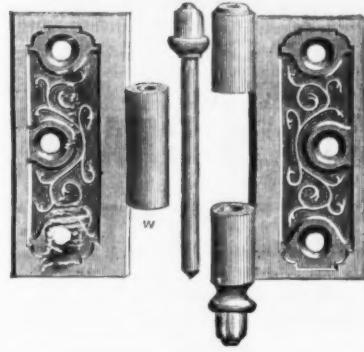
Manufacturers of the

Agents for  
NORWICH LOCK  
MFG. CO."BEAVER"  
(American)  
FILES and HORSE RASPS.  
"WIDE-AWAKE"  
AXES.

Patented March 4, 1873.

## CLARK & CO.,

MANUFACTURERS OF



## BUILDERS' HARDWARE.

426 & 428 Niagara Street,  
BUFFALO, N. Y.J. CLARK WILSON & CO., Agents,  
81 Beekman St., New York.  
Send for Catalogue and Price List.

## BRIGHAM, LITCHFIELD & VINING, TACKS, BRADS, NAILS, &c.

Manufacturers of all kinds of

All headed work assorbed by our new PATENT ASSORTER, which removes all dust and  
dross and imperfect Tacks, so that the purchaser pays for nothing but perfect goods. Every kind of  
Tack or Nail made to order from samples. We allow nothing out first-class work to go out of our factory.  
Also Manufacturers and Proprietors of

## HENDRY'S PATENT CARRIAGE AXLE.

Patented June 22, 1875.

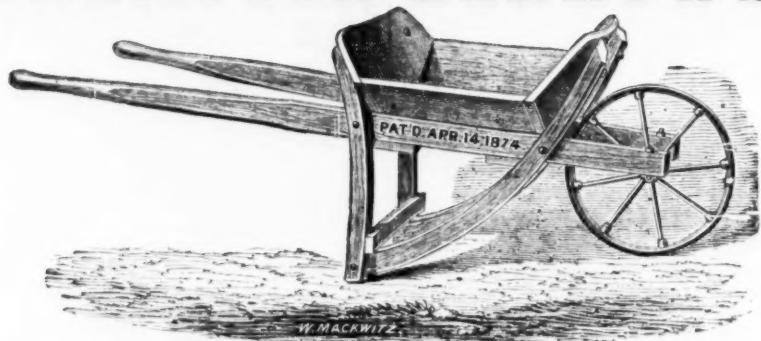
**DESCRIPTION.**  
A, Section of hub complete, showing oil-chamber o. B, Front  
band. C, Nut which screws on to box D, and confines box E and  
band B to the hub. D, Box which holds oil and the front band.  
E, Wrench in place on back nut. F, Axle with back nut  
screwed from box, and both stopped from the collar, showing  
leather washer each side of collar, and front band in place.

## POINTS OF EXCELLENCE.

No oil can come in contact with the wood of the hub. No oil  
can escape. No dirt, gravel or water can work. It holds the  
wheel to a superior manner. It is easier to oil than a common  
axle. It is adapted to any kind of a wheel. It requires no winding  
to oil. It can run 500 to 1000 miles at a single oiling.  
12" in ordering, give size of axle wanted, diameter of front  
band, and diameter of hub.

**SOUTH ABINGTON, MASS.**  
WAREROOMS,  
97 Chambers and 81 Reade Sts., New York.

## CHAMPION BARROWS



### WITH WOOD OR IRON WHEELS.

A first-class article and a specialty, that will make a demand in any market and afford a good margin  
for dealers. We are prepared to furnish them in large quantities. Manufactured by

**BRYAN MANUFACTURING CO., Bryan, O.**  
**SEMPLE & BIRGE MFG. CO., Sole Western Agents, ST. LOUIS, MO.**

For Sale by THE NEW YORK PLOW CO., General Eastern Agents, 55 Beekman St., New York.

## Bemis & Call Hardware & Tool Co.

This Wrench  
can be fur-  
nished with  
Bridge, Flat, Nut  
or Screw.

## PATENT COMBINATION WRENCH.

These Wrenches are made from the best of Wrought Iron, with Steel Head and Jaw, Case-Hardened  
throughout, and not only combine all of the superior qualities of our cylinder or Gas Pipe Wrenches, but  
also all requisite Combinations of a regular Nut Wrench, thus making a Combination which has no equal.

For Circulars and Price List, address,

BEMIS &amp; CALL HARDWARE &amp; TOOL CO. Springfield, Mass.

## Towne's Pat. Liquid Bronze, in all Colors & Shades.

Patented 1870, 1872 and 1874; Improved 1875 and 1877. **ARTHUR TOWNE, Patentee.**  
For Bronzing all goods, whether of metal, plaster or wood, viz.: Picture frames, ornaments, steam and gas fix-  
tures—in fact, iron goods and ware of every description. Is easily applied by anyone. For stripping it has no  
equal. The Post Office and Custom House in Boston and New York Custom House were decorated with this  
process. The Boston Yacht Club has no equal, having been used by the Boston Yacht Club the past four  
years, besides many others too numerous to mention.

**ARTHUR TOWNE**, Proprietor and Patentee, 118 Commercial St., Boston, Mass.  
Send stamp for circular and price list. Agents wanted.

## METALLIC SIEVES.



Protected by 14 patents.  
**MANN'S PATENT.**

Best Sieve known, Cheap, Neat and Durable.  
**ADAMS & WESTLAKE MFG. CO.,**  
CHICAGO, ILLS.

**GRANT & CO., Newark, N. J.**  
Cap Rifles & Targets.

**A. G. COES**  
PAT. DEC. 26. 1871.

Established in 1839.



A. G. COES &amp; CO.

WORCESTER,

Mass.,

Manufacturers of

THE GENUINE

COES'

## SCREW WRENCHES.

Our goods have been very  
much improved recently, by  
making the Bar **WIDE**, as  
shown in the cut, which makes  
a 12 in. Wrench as strong as a  
15 in. made in the ordinary way,  
and by using

A. G. COES'

NEW PATENT

## FERRULE

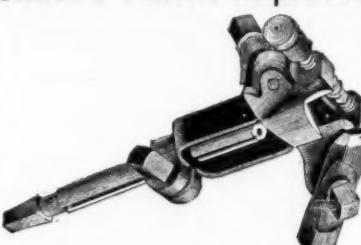
Which cannot be forced back

into the hand.  
One good & mammoth  
made up. Patents dated February 7, 1860, (re-issued June 29, 1871), May 2, 1871, and Dec. 26, 1871, and any violation of either will be vigorously prosecuted.

We call particular attention to  
our new Patent Ferrule, with its  
Supporting Nut (shown in section  
in the above cut), which makes  
the strongest Ferrule fastening  
known.

A. G. COES &amp; CO.

## Smith's Patent Improved.



## THE BEST ADJUSTABLE HOLLOW AUGER MADE.

E. M. BIRDSALL & CO., Pen Yan, N. Y., write:  
"The Tenon Auger, which you sent us on application,  
we have fully and severely tested. It is the  
best tool for the purpose which we have seen  
used."

**CHAS. M. GHRISKEY,**  
Manufacturers' Agent,  
508 Commerce Street, Philadelphia, Pa.



## COBB & DREW,

Plymouth, Mass.

Manufacturers of Copper, Brass, and Iron Rivets, Common and Swedish Iron, Leathered, Carpet, Lace and Glass  
Tacks, Finishing, Hungarian, Trunk, Clout and Cigar  
Box Nails, &c. Rivets made to Order.

NEW YORK AGENCY

**George C. Grundy,**  
HARDWARE.

165 Greenwich Street,  
Agent for the Philadelphia Star Carriage and Tire Bolts.

## Lloyd, Supplee & Walton, HARDWARE FACTORS.

MANUFACTURERS OF

## Bonney's Hollow

### AUGERS.

Stearns's Hollow Augers

and Saw Vises

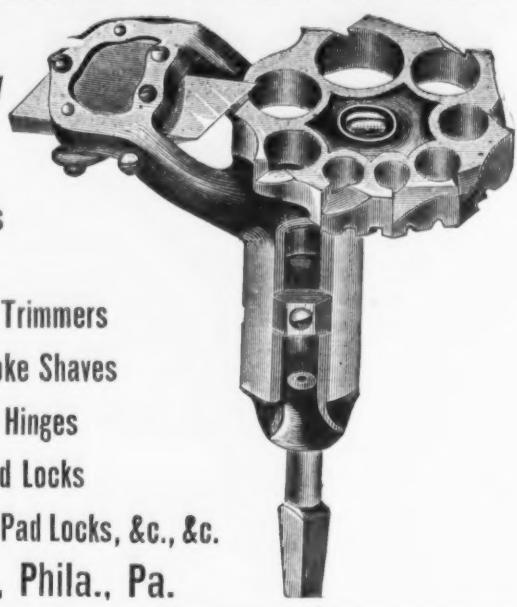
Bonney's Spoke Trimmers

Double Edge Spoke Shaves

Adjustable Gate Hinges

Scandinavian Pad Locks

Flat Key Brass and Iron Pad Locks, &amp;c., &amp;c.



625 Market St., Phila., Pa.

## "FELTER'S PATENT LOCKS,"

MANUFACTURED BY

## The American Lock Mfg. Co.,

Are the most SECURE and DURABLE ever made.

SECURE

Because they have 40 Brass Tumblers, independent in their action, either one of which will prevent the Lock from being opened unless brought to proper position by the Key.

DURABLE

Because we use no Springs to break or get out of place.

THEY HAVE  
STERLING METAL KEYS  
That will not corrode or wear, and are  
stronger than steel.



FULL SIZE OF KEY.

Upright Rim Dead Locks,  
Horizontal Rim Night Latches,  
Horizontal Rim Tubular Night Latches,  
Mortise Night Latches, Plain Fronts,  
Mortise Night Latches, Ornamental Bronze  
Fronts and Knobs,  
Brass Chest, Box, Cupboard and  
Drawer Locks,

Solid Bronze Padlocks.

Illustrated Catalogue and

Price List sent on application.

All orders should be addressed to



**UNION NUT CO.**, General Agents, 99 Chambers St., N. Y.  
**ENTERPRISE MFG. CO.**, Philadelphia.



## Enterprise Mfg. Co.

Make the

Only Irons Filled with

Non-Conducting

FIRE CEMENT.

Send for circular and price

list.

**MRS. POTTS'**  
Cold Handle Smoothing  
and Polishing Irons

Are made by  
Enterprise Mfg. Co.,  
PHILADELPHIA,  
And sold by  
The Hardware Trade.

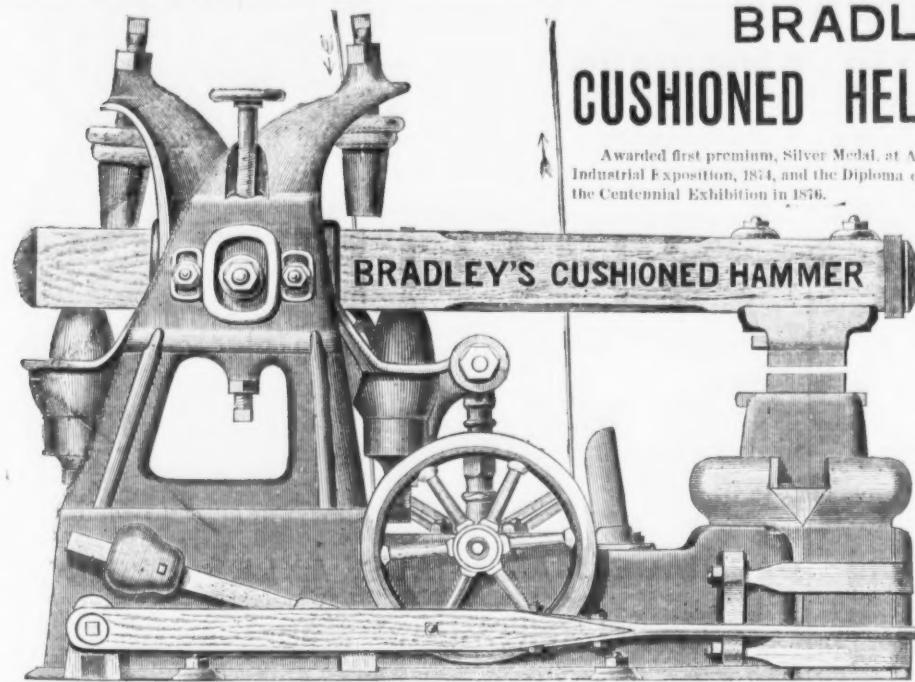
**V. G. HUNDLEY.**  
79 Reade Street, New York.



**North Carolina Handle Co.,**  
Manufacturers of  
SPOKES, AXE, PICK, SLEDGE, HAMMER, HATCHET and other HANDLES.

Full assortment always on hand.





## BRADLEY'S CUSHIONED HELVE HAMMER.

Awarded first premium, Silver Medal, at American Institute Fair, 1873, Cincinnati Industrial Exposition, 1874, and the Diploma of Honor and Grand Medal of Merit at the Centennial Exhibition in 1876.

BRADLEY'S CUSHIONED HAMMER

Being the highest award given any goods of their class in America or Europe.

It has More Good Points, Less Complications, More Adaptability, Larger Capacity, Does More & Better Work, Takes Less Power, Costs Less for Repairs, than any Hammer in the World.

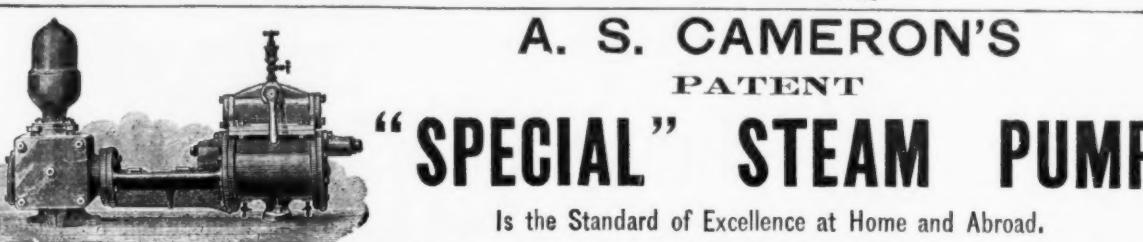
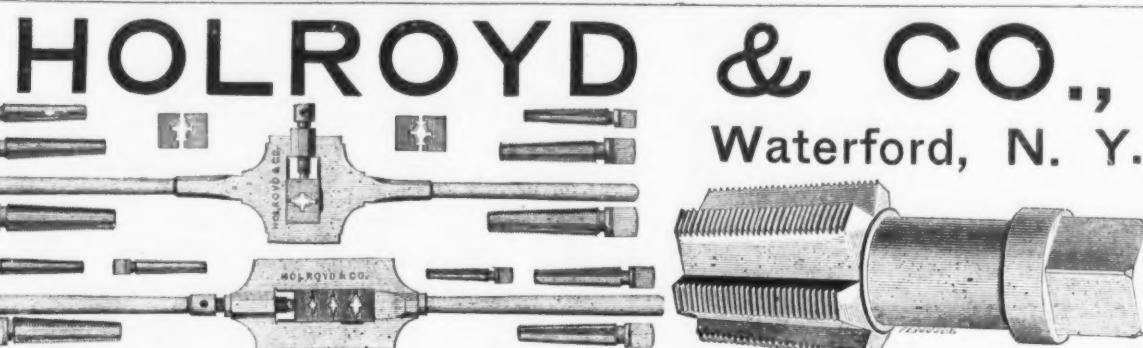
Guaranteed as Represented.

Bradley Mfg. Co.

SYRACUSE, N. Y.

Office, 100-102 Clinton St.,  
Western Office, 22 S. Canal St., Chicago, Ill.

A. B. BARNES, Manager.



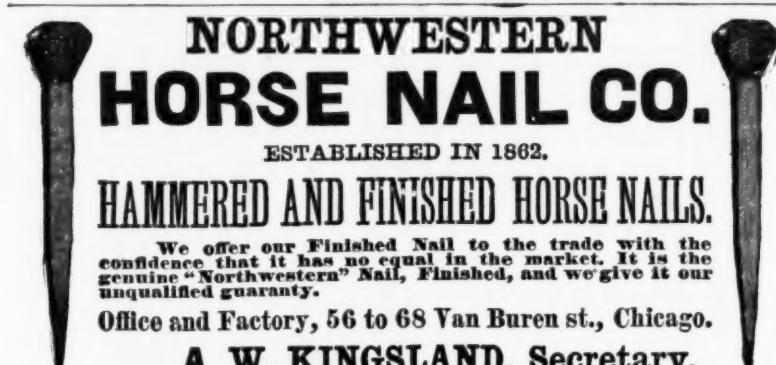
A. S. CAMERON'S

PATENT

## "SPECIAL" STEAM PUMP

Is the Standard of Excellence at Home and Abroad.

For reduced price lists address A. S. CAMERON, East 23d Street, New York.



## NORTHWESTERN HORSE NAIL CO.

ESTABLISHED IN 1862.

### HAMMERED AND FINISHED HORSE NAILS.

We offer our Finished Nail to the trade with the confidence that it has no equal in the market. It is the genuine "Northwestern" Nail, Finished, and we give it our unqualified guarantee.

Office and Factory, 56 to 68 Van Buren st., Chicago.

A. W. KINGSLAND, Secretary.

## GLOBE NAIL COMPANY,

MANUFACTURERS OF

### Pointed Polished & Finished Horse Shoe Nails.

Recommended by over 20,000 Horse Shoers.

All nails made from best NORWAY IRON, and warranted perfect and ready for driving. Orders filled promptly and at lowest rates by

GLOBE NAIL CO., Boston, Mass.

## THE FOWLER NAIL CO.,

SEYMOUR, CONN., Manufacturers of

### THE VULCAN HORSE SHOE NAIL

POINTED READY FOR DRIVING.

## Ludlow Valve Mfg. Co.,

OFFICE AND WORKS:

938 to 954 River St. & 67 to 83 Vail Ave., Troy, N. Y.,

### VALVES

Double and Single Gate,  $\frac{1}{2}$  in. to 48 in.—outside and inside Screws, Indicator, &c. for Gas, Water and Steam. Send for Circular.

Also FIRE HYDRANTS.

## RICHARD DUDGEON,

No. 24 Columbia Street, New York,

MAKER AND PATENTEE OF

### Hydraulic Jacks and Punches.

ROLLER TUBE EXPANDERS

And Direct-Acting Steam Hammers.

Communications by letter will receive prompt attention.

JACKS for Pressing on Car Wheels or CRANK PINS made to order

## THE ANTI-FRICTION BARN DOOR HANGER.

This well-known and popular Hanger is in too general use to require any description.

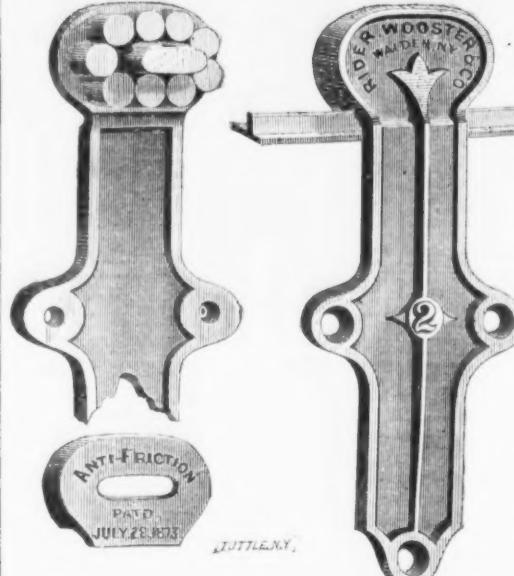
It is the

Original & Only  
Anti-Friction Hanger  
in the market.

Guaranteed to run twice as easily as any other style.

It is the ONLY ONE made without a Sheave or Wheel, and that will not mount the rail or run off the track.

Only two sizes made.



RIDER, WOOSTER & CO., Walden, N. Y.

## HARPER'S LUBRICATOR For Steam Engines.

This invention is an improvement upon that class of Steam Lubricators in which the lubricating material is floated (not by hydrostatic pressure) from the reservoir by the condensation of steam passing into the reservoir, and is susceptible of being applied to all kinds and styles of Steam Engines, by introducing the Lubricant to the steam ere it has created friction, so that it carries its own friction antidote to the valve, piston and rods, reducing friction, thereby saving oil, coal and packing.

The glass tube connected to the reservoir indicates the quantity of oil in the reservoir, the upper glass tube conveys to the eye the intelligence of the quantity of oil escaping. We might claim great economy of oil; that we leave with the engineer. We have made ample provision for large quantities, but at the same time it can be regulated as to be used in small doses.

This invention is in practical operation, and is highly endorsed by all those that are now using it.

Information concerning the LUBRICATOR may be obtained from

The Harper Steam Lubricator Co.,

WESTVILLE, CONN.,

Or of

F. H. WILLIAMS,

206 Broadway, Room 34, New York City.

## The Silver & Deming FAMILY SAUSAGE STUFFER, Lard, Fruit & Jelly Press.

Powerful, Durable and Convenient.

The Best Article of the kind in the Market.

|                          |        |
|--------------------------|--------|
| Price of 2 quart Stuffer | \$2.50 |
| " " 4 " "                | 3.50   |
| " " 2 " "                | 3.50   |
| " " 4 " "                | 3.50   |
| " " 4 " "                | 4.50   |

Liberal discount to the trade.

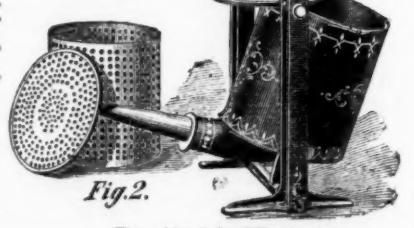
MANUFACTURED BY

SILVER & DEMING MFG. CO.,

SALEM, OHIO.

Also Manufacturers of a full line of

Butchers' Meat Choppers & Stuffers.



(Tipped back for filling.)

## C. A. & W. L. TEAL, Manufacturers of IMPROVED BENDING ROLLS

Arranged for Removing Work from the end of top roll.

COMBINED

Punching & Shearing Machines,

With "Automatic Stop motion."

"Adjustable to any point of the stroke."

Single Power Punching Machines,

With Shearing Attachments.

Steam Riveting Machines,

Boiler Makers' and Machinists' Post

Drilling Machines, Hair Pick-

ing & Cleaning Machines, and

MACHINERY

in general.

4116 Ludlow St., Philadelphia.

## BAEDER, ADAMSON & CO., Manufacturers of SAND & EMERY PAPER & EMERY CLOTH.

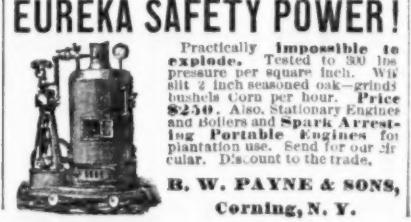
(Also, in Rolls for machine work.)

Ground Emery, Corundum & Flint, Clue & Curled Hair, Hair Felt, & Felt-  
ing for Covering Boilers, Pipes, &c., Cow Hide Whips.

Stores: PHILADELPHIA, 730 Market St., BOSTON, 143 Milk St., NEW YORK, 67 Beck St., CHICAGO, 182 Lake St.

## C. S. OSBORNE & CO., Manufacturers of SADDLERS' AND HARNESS MAKERS' TOOLS.

No. 96 Mechanic St., NEWARK, N. J.



Screw  
Kulv  
Marking  
Pistol  
Oyster K  
Gings, Bl  
Springs,  
Spoon C  
DRIVE  
Spring.



## THE JUDSON GOVERNOR.

It is a common method to advertise Governors *without cost*, unless satisfactory to the customer, and then charge *High Prices* for doing what any good Governor will do. Various Governors interfere with the "Judson" are said to this way, operating well enough for a time, but failing to insure the payment of the pay, but becoming useless after a year's wear—their construction, on lacking durability, the Judson Governor is guaranteed to be not only the best Regulator of Steam Engines, but also the most durable Governor made. Parties in buying other Governors would stipulate that their durability be guaranteed, and should also take care that they do not for much inferior Governors, pay higher prices than those shown in the accompanying list. We guarantee the Judson Governor will do all any other Governor can do, and in Accuracy and Durability—the main essentials—we guarantee it shall do more.

### Reduced Price List, FEBRUARY 1, 1877.

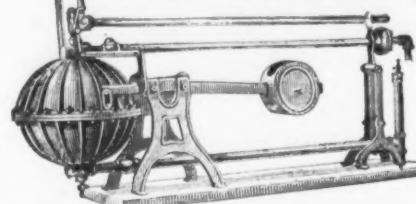
For dimensions of Governor, see Illustrated Price List.

| Size, Inch. | Plain.  | Bright<br>Fin.-<br>ished. | Extra<br>for<br>Spe. Dr. | Stop<br>Valve. |
|-------------|---------|---------------------------|--------------------------|----------------|
| 1 1/2       | \$16.00 | \$18.00                   | \$1.90                   | ...            |
| 2 1/2       | 21.00   | 22.00                     | 2.01                     | \$5.00         |
| 3 1/2       | 22.00   | 26.00                     | 2.25                     | 6.00           |
| 4 1/2       | 26.00   | 30.00                     | 2.50                     | 8.00           |
| 5 1/2       | 31.00   | 35.00                     | 2.75                     | 10.00          |
| 6 1/2       | 36.00   | 41.00                     | 3.25                     | 12.00          |
| 7 1/2       | 40.00   | 45.00                     | 3.50                     | 14.00          |
| 8 1/2       | 45.00   | 51.00                     | 3.75                     | 16.00          |
| 9 1/2       | 50.00   | 57.00                     | 4.25                     | 19.00          |
| 10 1/2      | 67.00   | 74.00                     | 4.50                     | 23.00          |
| 11 1/2      | 80.00   | 90.00                     | 5.50                     | 34.00          |
| 12 1/2      | 90.00   | 101.00                    | 6.00                     | 40.00          |
| 13 1/2      | 105.00  | 117.00                    | 6.50                     | 46.00          |
| 14 1/2      | 120.00  | 133.00                    | 7.00                     | 54.00          |
| 15 1/2      | 142.00  | 156.00                    | 8.00                     | 65.00          |
| 16 1/2      | 175.00  | 192.00                    | 9.00                     | 79.00          |
| 17 1/2      | 198.00  | 218.00                    | 10.00                    | ...            |
| 18 1/2      | 210.00  | 240.00                    | 12.00                    | ...            |

No Charge for Boxed & Cartage.

JUNIUS JUDSON & SON, Rochester, N. Y.

## The Albany Steam Trap.

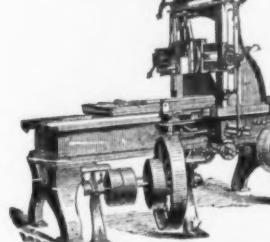


This Trap automatically drains the water of condensation from *Heating Coils*, and returns the same to the Boiler whether the Coils are *above or below* the water level in Boiler, thus doing away with pumps and other mechanical devices for such purposes. Apply to

Albany Steam Trap Company,  
Albany, N. Y.

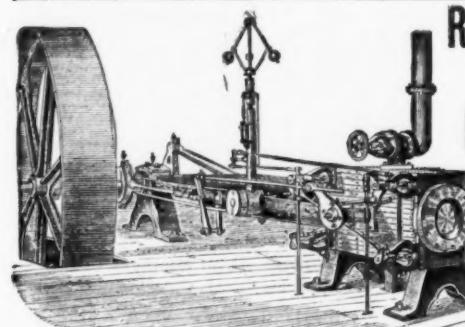
## The Pratt & Whitney Co., Hartford, Conn.,

Have constantly on hand and making



## Drop Hammers

Of recently Improved Construction. Pony Trip Hammers, Blacksmiths' Sheaves, Broaching and Stamping Presses, Iron Shop Cranes, Machinists' Tools, Gun and Sewing Machine Machinery. Make to order Gray and Charcoal Iron Castings of all styles and sizes not exceeding 15 tons weight, (making patterns if desired). Furnish Clamp Pulleys of light patterns, cut gears in a superior manner, &c. &c.



Robt. Wetherill & Co  
CHESTER, PA.  
Corliss Engine  
BUILDERS,  
Shafting & Gearing,  
Boiler Makers.

## R. S. NEWBOLD & SON, Eagle Works.

Norristown, Pa.

IMPROVED ROTARY SHEARS,  
Rolling Mill, Blast Furnace, Flour  
Mill, Mining and Water Works  
Machinery. Air Compressors,  
Ore Washers and Brick  
Machines.

### REFERENCES:

Rotary Shears for Plates and Circles.  
A. Wood & Co., Conshohocken, Pa.  
Ernst Stridsberg, Sweden.  
Lewis Drizell & Co., Pittsburgh, Pa.  
H. A. Seale & Co., Parkersburg, Pa.  
Rolling Mill & Blast Furnace Plants & Engines.  
Merion Furnaces, Conshohocken, Pa.  
A. A. Morris, Righterville, Pa.  
Clover Spring Iron Works, New York.  
Norristown Water Co.  
Oliver & Co., Easton Sheet Mill.  
Portsmouth Iron Co.'s Plate Mill.  
F. W. Morris, Morrisville, Pa.  
Morris, Tasker & Co., Engines.

Burand & Marais' French Pat. Brick Machine  
For Brick Yards and Fire Brick Works, makes 10,000 superior bricks per day with two horse-power. In use at Brooklyn Brick Yards, Lynchburg, Va.; F. W. Kickbusch, Wausau, Wis.; Cheltenham Fire Brick Works, St. Louis, Mo. Can hack bricks 12 high at once. The best, simplest and cheapest machine made.



THORNE, DeHAVEN & CO., Drilling Machines,  
21st Street, above Market, Philadelphia.

PORTABLE DRILLS. Driven by power in any direction.  
RADIAL DRILLS. Self-feeding.  
VERTICAL DRILLS. Self-feeding.  
MULTIPLE DRILLS. 2 to 20 Spindles.  
HORIZONTAL BORING AND DRILLING MACHINES.  
HAND DRILLS. CAR BOX DRILLS.  
SPECIAL DRILLS. For Special Work.



H. H. HARVEY'S HAMMER AND TOOL WORKS,  
Augusta, Me.

SPECIALTIES.—Stone Cutters' Hammers and Tools, Quarrymen's Drills, Wedges and Half Rounds, &c., &c., Miners' Hammers and Tools, Blacksmiths' Hammers and Tools, Patent Hammer for picking burr-stone. Also the common Mill Picks and Wood wedges Steel or Iron. H. H. Solid eye Picks, with one lb. of neat Cast Steel inserted in each pick. The above goods are warranted inferior to none, both in quality and style of finish. All hammers have true eyes and polished faces, and are made from solid cast steel. No charge is made for boxing or packing at American shipping rates. Hammers made to my pattern or drawing. Capacity of one ton of hammers per day. A full line of the above goods constantly in stock. Catalogue on application.

## BLAKE'S PATENT STONE & ORE BREAKER.

New Pattern with Important Improvements & Abundant Strength

For reducing to fragments all kinds of hard and brittle substances, such as STONE for making the most perfect MACADAM ROADS, and for making the best CONCRETE. It breaks stone at trifling cost for BALLASTING RAILROADS. It is extensively in use in MINING operations, for crushing

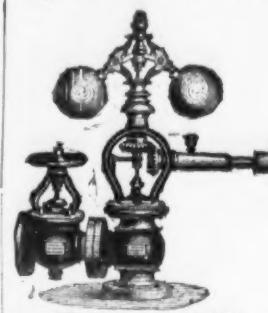
IRON, COPPER, ZINC, SILVER, GOLD, and other ORES.

Also for crushing QUARTZ, FLINT, EMERY, CORUNDUM, FELDSPAR, CANT, BARYTES, Manganese, Phosphate Rock, Plaster, Sandstone, &c., &c. For illustrated circulars, and particulars, address,

BLAKE CRUSHER CO., New Haven, Conn.

## Reduced Price List, FEBRUARY 1, 1877.

For dimensions of Governor, see Illustrated Price List.



THE JUDSON PATENT

Improved Steam Governor.

10 210.00 240.00 12.00

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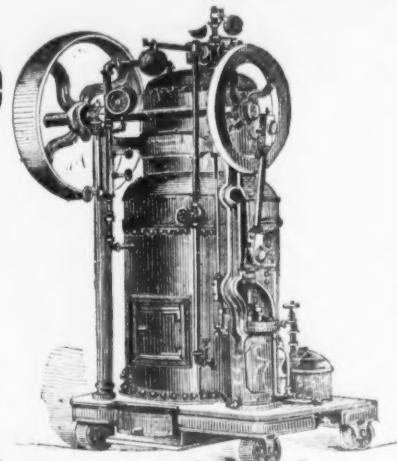
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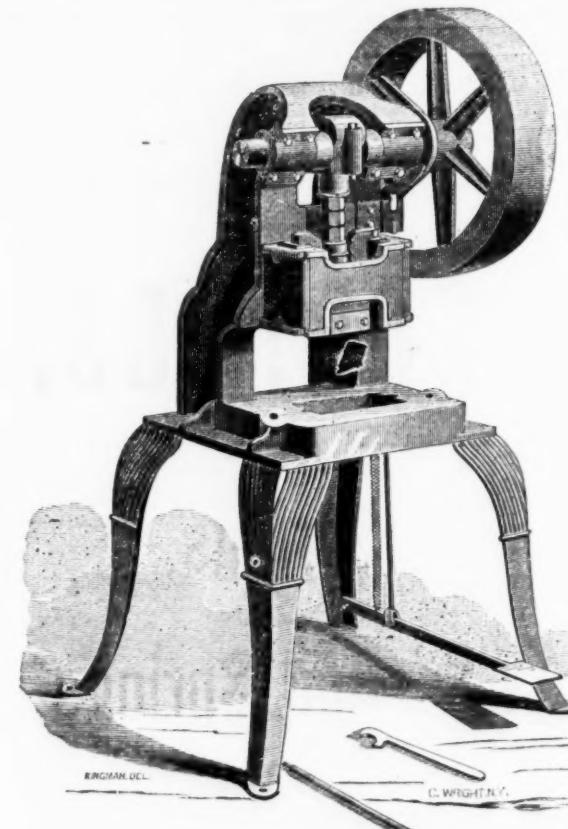
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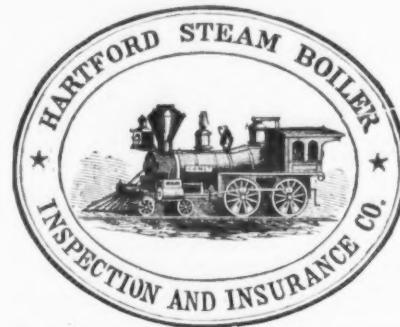
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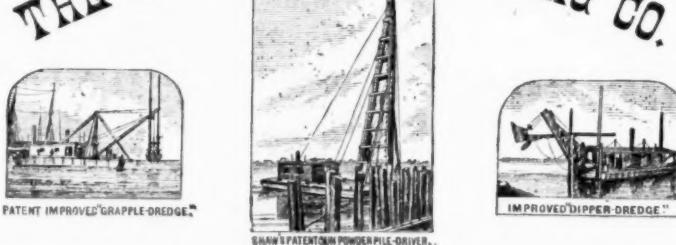
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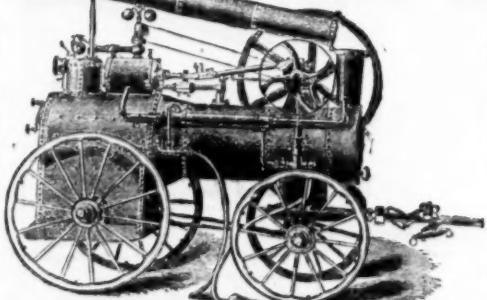
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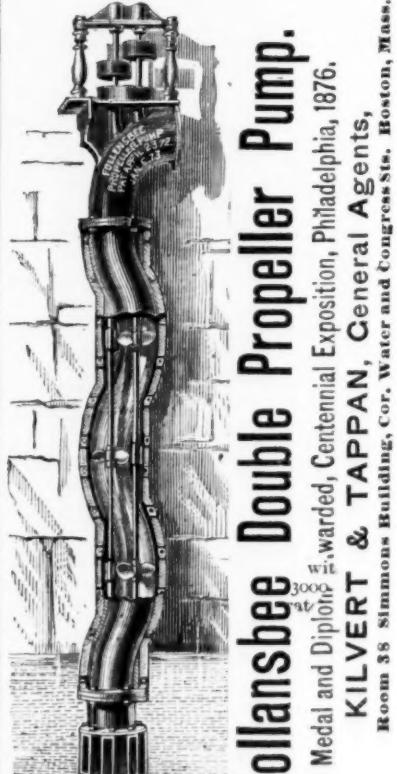
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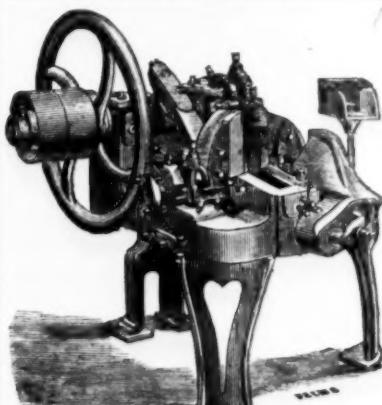
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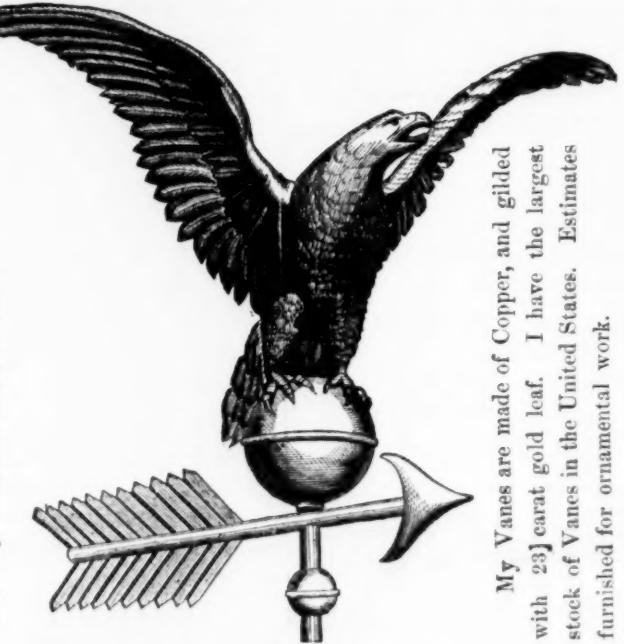
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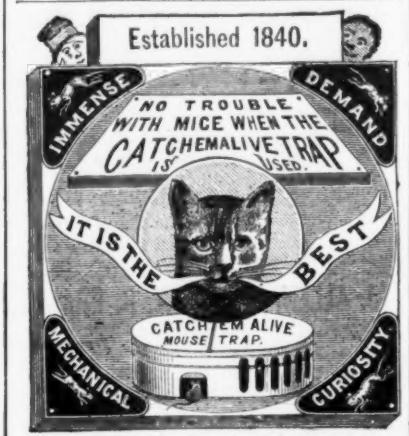
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